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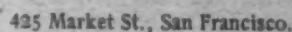
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THE IRON AGE

THURSDAY, JANUARY 2, 1902.

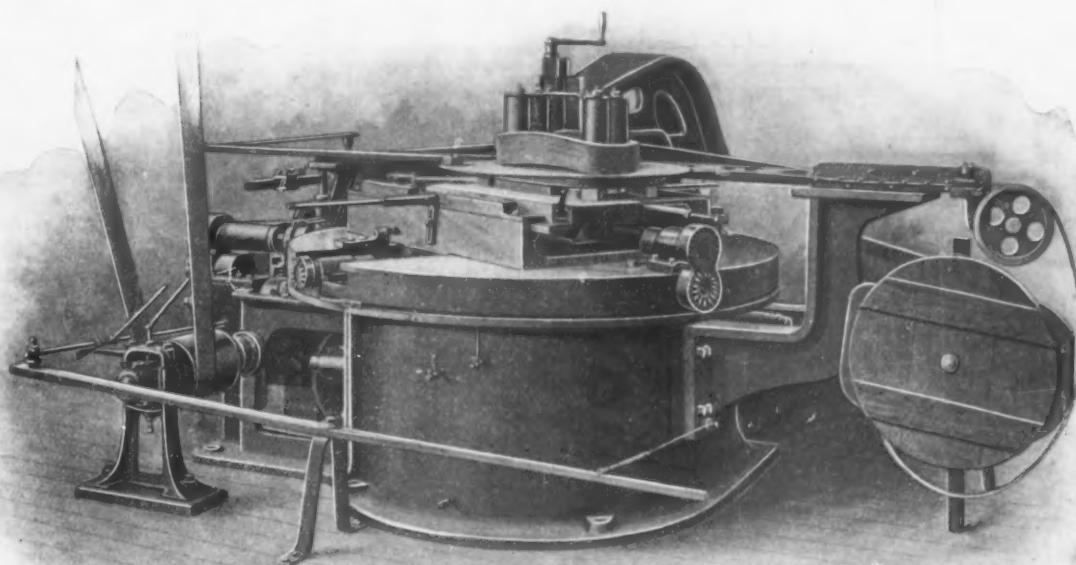
Winding Field Coils from Flat Copper Strips. 448 10

FLAT STRIPS BENT EDGEWISE TO ANY DESIRED SHAPE, WITH NO BUCKLING AND NO CHANGE IN AREA OF CROSS SECTION.

There is now in operation at the works of the General Electric Company at Schenectady, N. Y., a machine which winds copper ribbons edgewise into coils for the fields of electrical machines. The machine is the invention of John Riddell, the mechanical superintendent of the works, and is an improvement upon the apparatus designed by Henry Geisenhoner. With it coils of ribbon or flat strips of any desired shape, and wound edgewise, are produced, this result being due chiefly to a non-circular former, to which are imparted movements of

serve, after the portion of the strip has been drawn into the machine, to anchor it while it is being bent.

The disk D, Fig. 7, is mounted on the tool steel former F, Figs. 3, 4, 6, 8, 15, 16 and 17, and the latter is screwed to its base B, which is in turn mounted on the upper reciprocating platform T of the machine. The former is designed to produce the desired coil or winding, and a different former is secured to the base B for every different winding desired. The former base is furnished with legs A, Fig. 6, which rest on the upper



WINDING FIELD COILS FROM FLAT COPPER STRIPS.

reciprocation and rotation. Provision is also made for preventing the ribbon from buckling or wrinkling in any direction under the enormous strains to which it is subjected while being wound edgewise.

For convenience of description the machine may be divided into four parts, as follows:

1. The power connections.
2. The main moving parts, which are driven by the power connections, and which, in turn, actuate the parts which carry out the bending operation itself.
3. The automatic mechanism which controls the alternately acting clutch connection between the power connections and the main moving parts.
4. The devices which are operated by the main moving parts to perform the bending operation. The last is described first in order to give a clear idea of what is accomplished and of the movements brought into action.

Bending Operation.

As shown in Fig. 13, the ribbon or strip X is drawn into the machine from a reel, Q, over an idler, R, through an idler, V, and finally through the tension pins U, which

platform T, these legs providing a space between the platform and the bottom of the base, in which space is accessibly located the lower portion of the bolt E, which retains the base and disk together. This bolt also secures to the disk and former base a support, C, Figs. 3 and 4, which carries the ribbon after it has been wound and has passed through the slot I in the disk D. Spools O are mounted upon the support C and serve to carry the coil as it gradually increases in size as the bending operation is continued. The former must be given both longitudinal and revolutionary movements. In Fig. 8 the bolt E is shown to be angular where it passes through the former base B, former F, and the support C. Thus the support C, upon which the wound coil is carried, shares the movement of the former F, and the successive portions of the ribbon as they are bent and pass through the slot I in the disk simply take their places around the support C and the spools O mounted upon it; but the bolt is circular where it passes through the disk, and this construction permits the disk to be held from rotation by a lever Z, Figs. 2, 4 and 5, and which is attached to the disk D at Y, and is mov-

ably mounted at its other end in any desired manner. Although the disk is held from rotation, it has a most peculiar revolutionary movement. The function of the disk is to provide a path from the wound ribbon to a position beyond the winding means. In this case the disk has an additional function and serves also as a pressure disk to hold the ribbon in place as it is being wound.

The ribbon is wound by the revolutionary movement of the former and fresh portions of the ribbon are drawn from the reel into the machine by the longitudinal movement of the former. The former F is subjected to a left hand revolution, as indicated by the arrows in Figs. 15, 16 and 17. In Fig. 15 is shown in full lines the position of the former when it has nearly completed its revolutionary or winding movement. A sufficient portion of the ribbon has by a previous longitudinal movement of the former to the right been drawn into the machine to provide material for a quarter turn of the coil. The dotted lines in Fig. 15 indicate the position of

securely held, but so far no means has been described by which the ribbon can be held against sidewise movement after it has been bent and has passed around the corner W away from the supporting edge of the strip S. If such means were not provided the ribbon might bulge edgewise at the point H under the strain to which it is subjected at the bending point W. This means is clearly shown in detail in Fig. 9 and its application is illustrated in Figs. 4, 15, 16 and 17. A little in advance of each corner of the former F the former base B is perforated, only an annular shoulder being left. An automatic holding device H fills the upper part of this perforation and a helical spring resting on the shoulder tends to move the device H upward. The lower part of the device extends through the hole inclosed by the annular shoulder, and being threaded, is engaged by a nut to secure the device in position. These several holding devices, one for each side of the former, tend to extend above the surface of the former base, and each is provided with a shoulder, which holds the ribbon

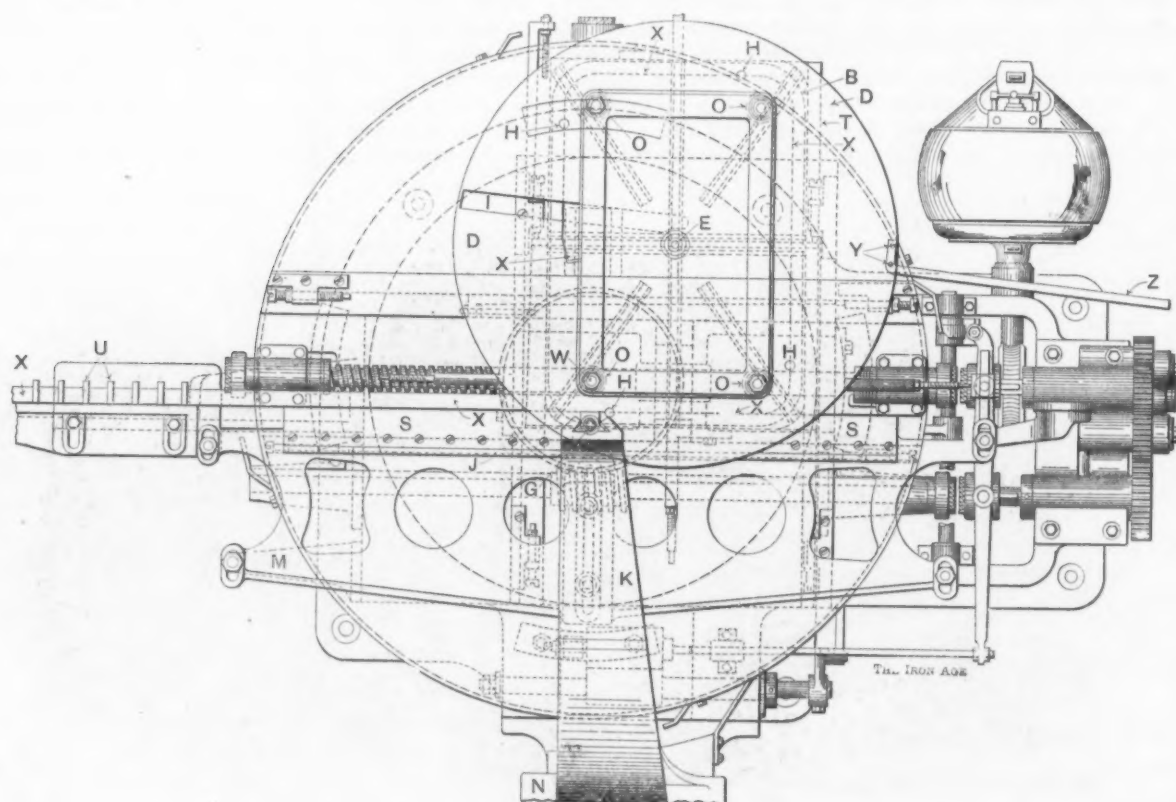


Fig. 2.—Plan.

WINDING FIELD COILS FROM FLAT COPPER STRIPS.

the former when it has completed its revolutionary movement and is about to be moved longitudinally to the right to draw or feed the ribbon X from the reel Q into the machine. A strip, S, of tool steel is screwed to a portion, M, of the machine and projects over the top of the former base B, which is movable beneath it. This is clearly shown in Figs. 3 and 6. The disk D hangs over this strip as well as over the former base B. The broad surfaces of the ribbon are held between the former base and the disk and its edges are held between the edge of the strip S and the edge of the former F. A lug serves as an anchor to prevent the displacement of the strip under the bending strains. In Fig. 15 the bending operation has been nearly completed at the corner W, which is the central point of the rotating table; but the portion X' of the ribbon now extends at an angle to the unwound portion and will pass through a slot in the disk D and out upon the support C and the spools O before the former has turned through three-quarters of a revolution.

That portion of the unwound ribbon which lies between the edges of the former F and the strip S is

against the edge of the former after it has been bent or wound away from the supporting edge of the strip S at the corner W. In Fig. 15 the right hand holder H is serving this purpose and continues to do so until the ribbon which it holds against the edge of the former base passes through the slot of the disk and out upon the supporting spools O. The holder H, however, continues to extend above the surface of the former base, although it has no ribbon to hold when it is being carried down the lower portion of its third quarter of a revolution. As soon as the holder H reaches the strip S at the end of its third quarter of a revolution its beveled upper portion engages the lower surface of the strip and the helical spring is put under compression to permit the holder to pass beneath the strip; then the holding device is drawn by the former base longitudinally beneath the lower surface of the strip, a fresh portion of the ribbon being drawn into the machine by the same operation.

In order that one of the holders shall hold the ribbon against the edge of the former throughout the entire bending operation the holder must engage the edge of

the ribbon just before the latter is carried away from the strip at the corner W. To accomplish this a slot, L, is cut in the strip S, and as the former B reaches the end of its movement the holder, which has been held down by the lower surface of the strip, springs up and engages the edge of that portion of the ribbon which is

gripped the edge of the ribbon as a substitute for the edge of the strip S, which has hitherto held the ribbon against the edge of the former. In this position of the holder the revolutionary or bending motion of the former is about to take place and the holder will pass out of the slot L along the curved right hand end of the lat-

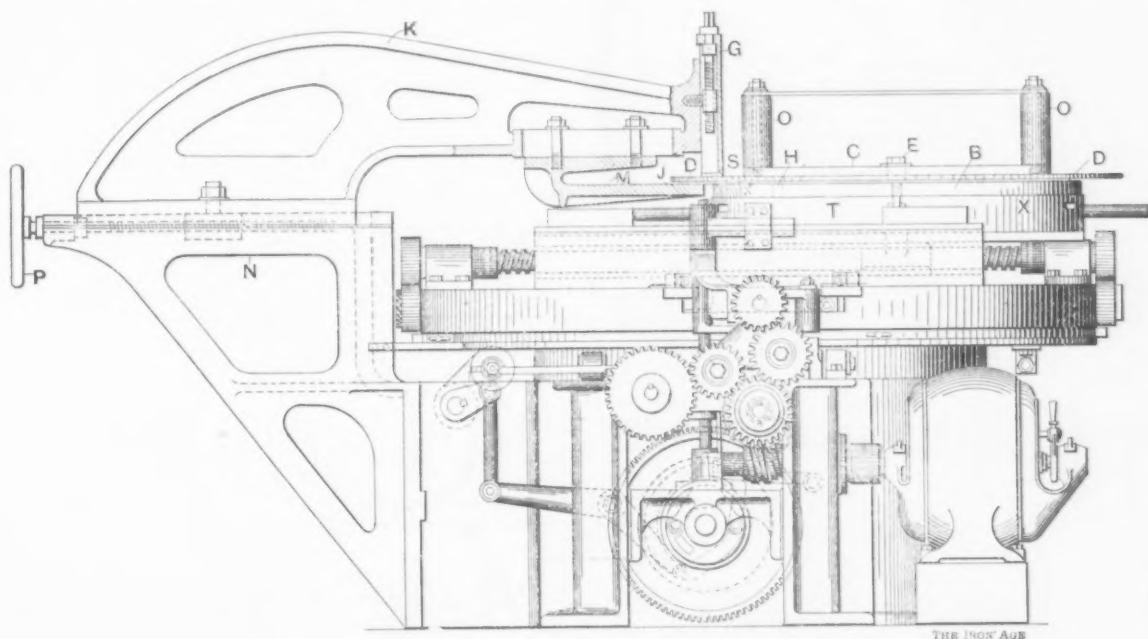


Fig. 3.—Right Hand End Elevation of Fig. 2.

to be bent and holds it securely against the edge of the former from that time on through the bending operation and until the bent ribbon has passed through the slot I in the disk D and out upon the supporting spools O. In Fig. 16 the disk D, former base B and the former F have been carried to the right to draw a sufficient length of the ribbon into the machine for the next bending operation. In this drawing the disk is broken away in

ter, and will start on its revolution about the center W of the table, as illustrated in Fig. 2.

This revolution is interrupted when the former base B has been revolved, so that its left hand vertical side in Fig. 16 has been carried to a position parallel to or adjoining the unwound ribbon, and the parts will then be again carried longitudinally to the right and another holder H will operate to hold the new portion of the

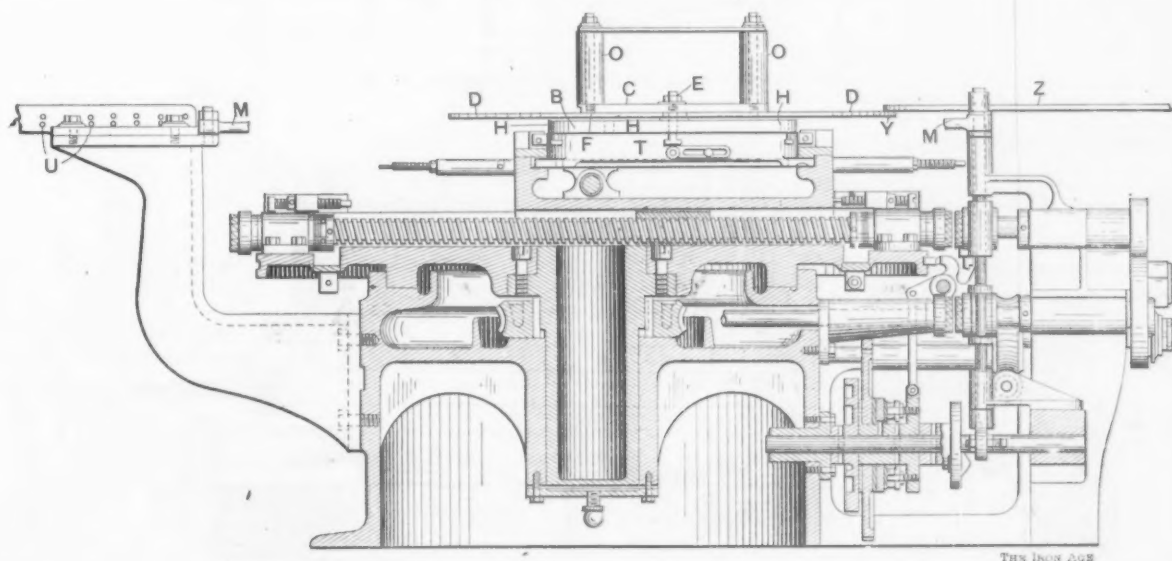


Fig. 4.—Vertical Longitudinal Section of Fig. 2.

WINDING FIELD COILS FROM FLAT COPPER STRIPS.

order to clearly disclose the parts, although it should be remembered that it overhangs the strip S and that the ribbon passes through the space formed between the disk D and the former base B.

In the left hand or dotted position of the moving parts the holder H has been carried to the edge of the slot L in the strip S, and in the right hand or full line position of the parts the holder has passed the left hand H of the slot and has sprung up and with its shoulder has

ribbon against the edge of the former, F, and then another winding revolution of the parts will take place. In Fig. 17, the strip S being fixed, the entire structure held together by the bolt E is being carried longitudinally to the right to draw in the ribbon preparatory to the bending revolution. The edge of the strip S is holding the ribbon X against the edge of the former F, and a holding device, H, is depressed beneath the strip S and is ready to spring up into the slot L to grip the edge of

the ribbon. The other device H is shown holding the ribbon X' against the vertical edge of the former F.

It should be noted that each holder, H, is located just in advance of one of the corners of the former F. Each

moved also and a new unslotted one is screwed upon the frame M in place of it. The machine is then set in operation without starting the ribbon, and the mechanic scratches on the strip S the two extreme limiting points

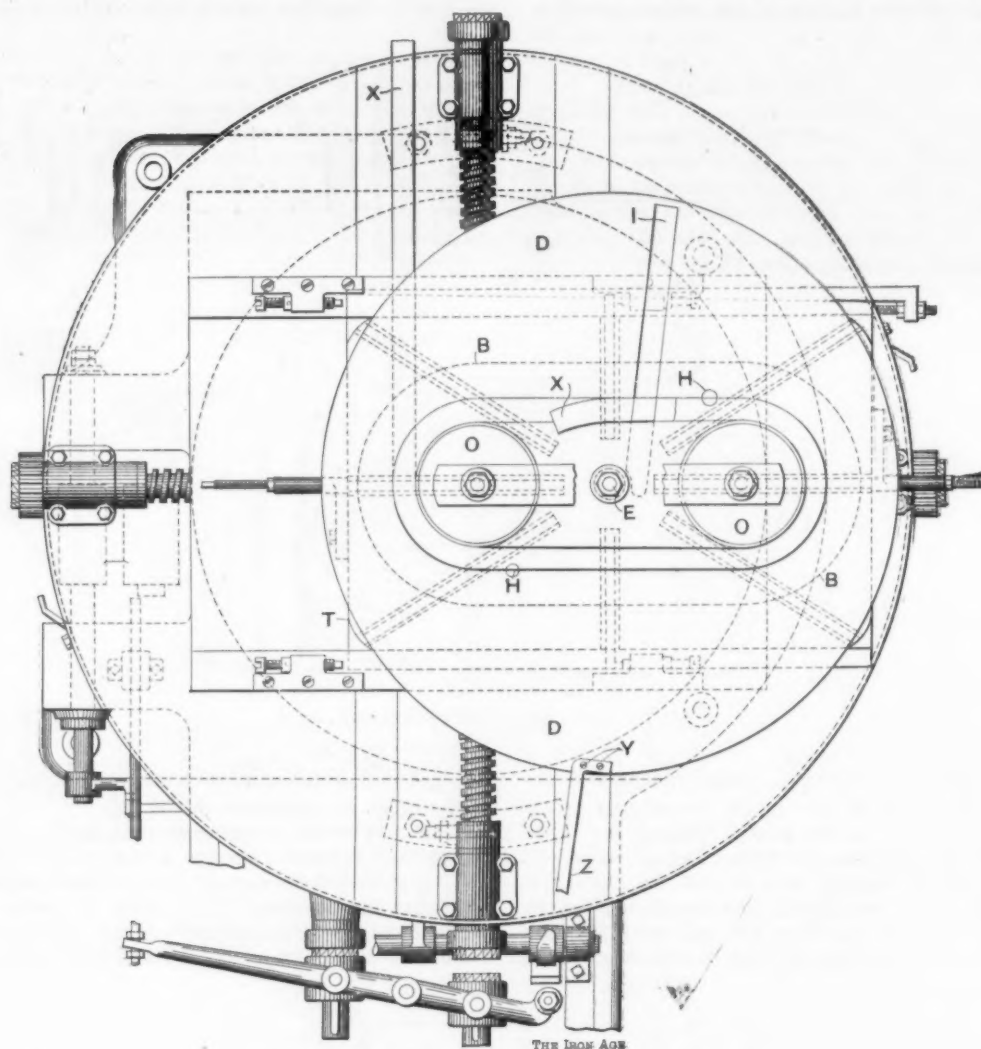


Fig. 5.—Plan Showing the Winding Operation.

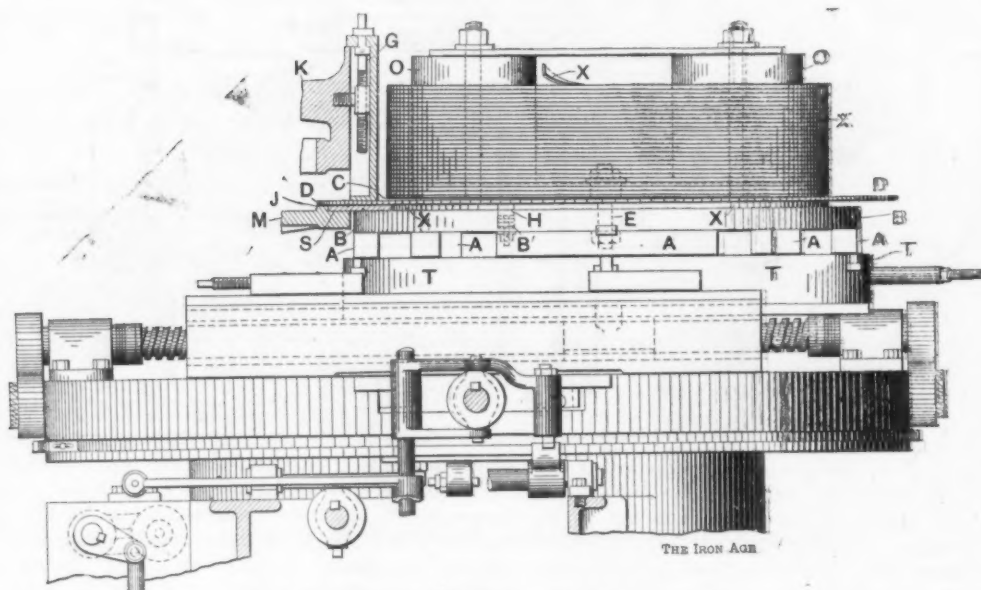


Fig. 6.—Elevation of Fig. 3 with Gears Removed.

WINDING FIELD COILS FROM FLAT COPPER STRIPS.

time that the machine is set up to wind a new form of coil the old former F and the former base B are removed and new ones suitable for the production of the desired winding are substituted. The strip S is re-

where the holders leave the strip when revolved with the new former from the position to which they are carried by the long and short sides of the latter. The slot is then cut as thus indicated and the machine is

ready for operation if the actuating mechanism is properly adjusted.

The disk D has a most irregular movement. It is held from rotation as above described, but has what may be termed a "wavy" revolution, as it shares in the longitudinal and revolutionary movements of the former base B and former F. The result is that it always covers the parts at the bending point W and holds the ribbon in place. As shown in Fig. 6, an adjustable device, G, provided with a strip of fiber at its lower end,

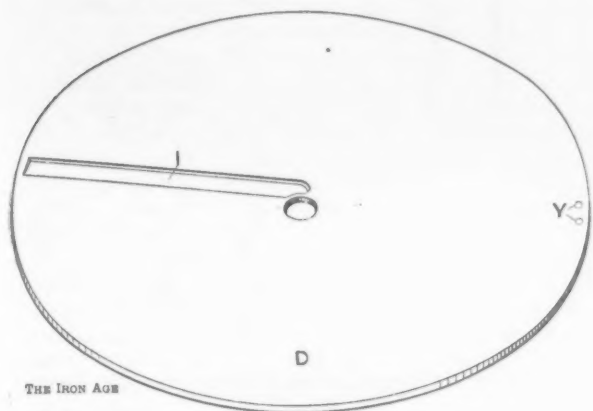


Fig. 7.—Perspective View of Pressure Disk Under Which the Ribbon is Held During the Winding.

presses on the disk D, and this prevents the ribbon from forcing the disk upward, which would permit the ribbon to wrinkle. This device is also shown in Fig. 3, and it will be noted that it is carried by a frame, K, which is adjustable on the support N by a block and bolt, as shown. The part M, on which the tool steel strip S is mounted, is also secured by the bolts shown to the frame K. Thus by the wheel P, which turns the bolt, a longitudinal adjustment of the frame K can be obtained.

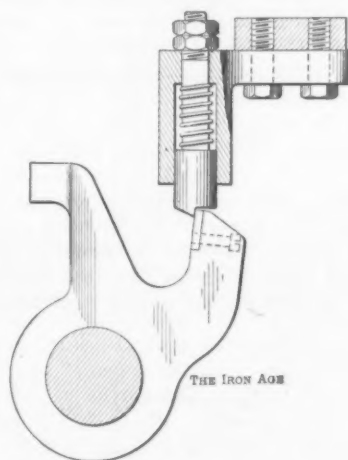


Fig. 10.

Detail Views of Parts of the Automatic Actuating Mechanism.

WINDING FIELD COILS FROM FLAT COPPER STRIPS.

The device G and the part M are both adjusted simultaneously. The wheel P is turned until the right hand edge of the strip S abuts against the edge of the ribbon X in order that the ribbon may be securely held against the edge of the former F.

Driving Mechanism.

The main parts which carry on the bending operation are upper and lower reciprocating platforms and the rotating table. The upper platform T, which is best shown in Fig. 4, carries the former base B and the former plate F. This upper platform is reciprocally mounted in ways of the lower reciprocating platform. In bearings formed in the rotary table is mounted a worm for reciprocating the upper platform. The table

has a left hand rotation, as indicated by the arrow in Fig. 2, and causes the already mentioned left hand revolution of the former F.

On each end of the worm shaft is a gear arranged to

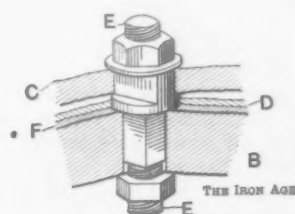


Fig. 8.—View Showing How the Disk, Fig. 7, is Held.

coact with gears on the periphery of the rotating table. Each gear is formed with a clutch member, each of which two members in turn engages with its power driven clutch member, which is in turn driven by a gear to move the upper platform T along its ways alternately in opposite directions.

The lower platform is mounted on the rotating table

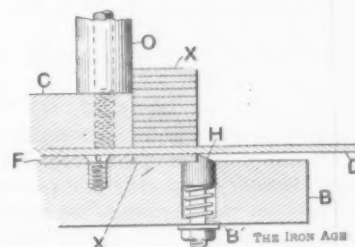


Fig. 9.—Vertical Section of One of the Devices Which Assist in Holding the Ribbon During Winding.

to slide across it at an angle of 90 degrees with respect to the direction of movement of the upper platform. Clutch members are here again provided, being spaced

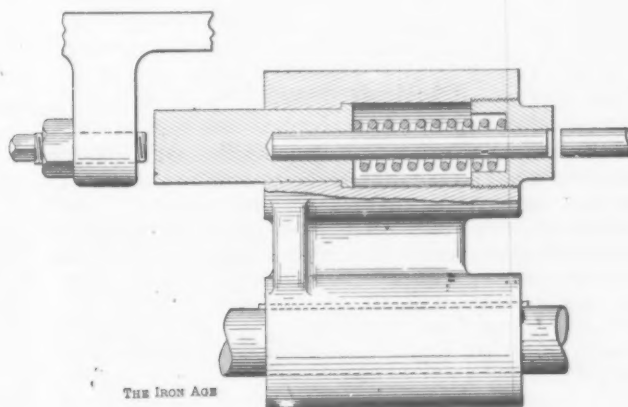


Fig. 11.

90 degrees apart around the table. When the machine is in operation (whichever of the clutch members of the upper or lower platforms), one of the latter is moved to the right, Fig. 4, to draw the ribbon into the machine. After either platform has been moved the required distance it is automatically unclutched, after which the table is rotated until the clutch member of the other platform faces the driving clutch member. In this construction a cycle of operations is continued automatically as long as power is applied to the machine and the bending operations are carried out.

Power Connections.

Arranged between the source of power and the main moving parts of the machine is a safety friction device

which is intended to guard the machine from injury in case its operation is interfered with in any way. The construction is such that the rotating table and either one of the platforms can never be simultaneously connected with the source of power. In Figs. 2 and 3 both

coil shown in Fig. 2, this particular platform is used because it is of less mass than the lower one and has to move a longer distance. As the table rotates it brings into action suitable devices which unclutch it. A clutch member of the upper platform is brought into

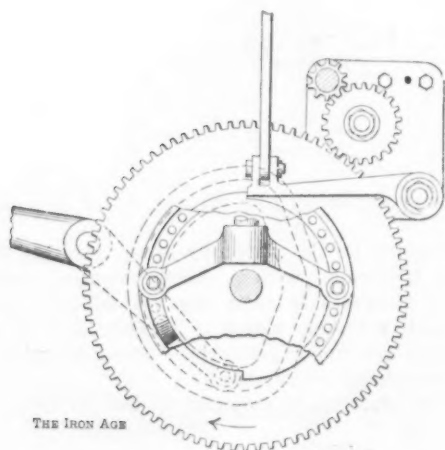


Fig. 12.—Part of Automatic Actuating Mechanism.

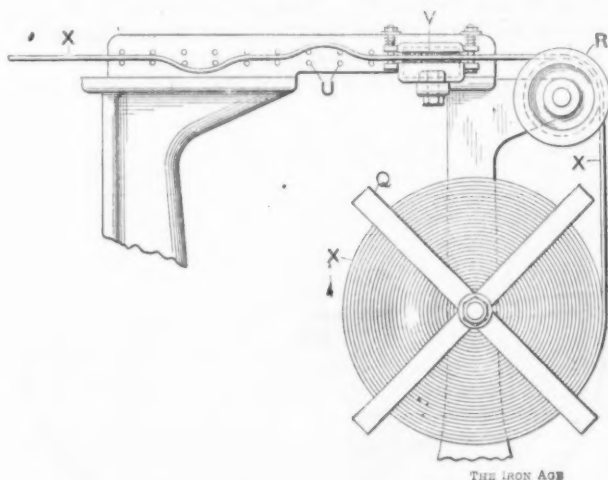


Fig. 13.—Elevation of Safety Tension Mechanism through Which the Strip is Drawn.

power clutch members are shown disengaged from the respective table and platform clutch members. This is a condition which is only temporary and exists for only a very short interval of time between the instant that the table stops rotating and the instant that one of the plat-

form approaches the end of its travel it is unclutched and engagement with its fellow clutch member and by means of gears this platform is moved to the right to draw a fresh portion of the ribbon into the machine sufficient for a long side of the coil. As the platform approaches the end of its travel it is unclutched and

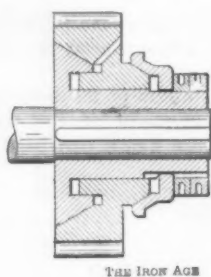


Fig. 14.—Friction Clutch.

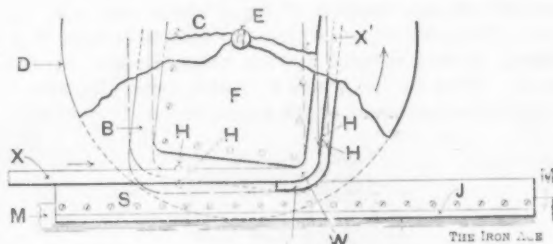


Fig. 15.

forms begins to move. As soon as the table is unclutched a powerful spring brake secured to a stationary part of the machine engages with its free end a notch which is one of four notches formed in the periphery of the rotating table. This prevents the continued mo-

locked in position. The table then again rotates and similar movements are imparted to the lower table.

In Figs. 5 and 6 the machine is shown adapted for the production of elliptical coils. In this instance the table has a half rotation instead of a quarter rotation, as

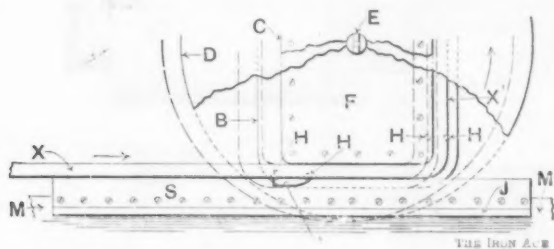


Fig. 16.

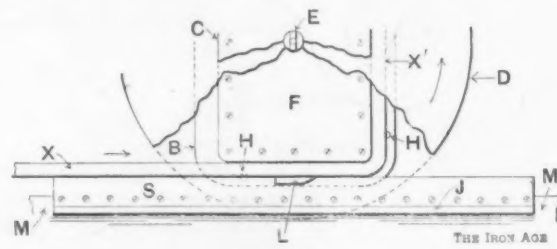


Fig. 17.

The Last Three Figures Are Plan Views of the Parts Which Carry Out the Winding Process.

WINDING FIELD COILS FROM FLAT COPPER STRIPS.

mentum rotation of the table, which is stopped in such a position that one of the platform clutch members is face to face with a power clutch member.

Automatic Mechanism for Moving Platforms.

In describing the automatic mechanism whereby the upper platform T is moved to draw into the machine a portion of the ribbon sufficient for a long side of the

was the case when a four-sided coil was wound, and this half rotation forms one of the semicircular ends of the elliptical coil.

At the recent annual convention of the American Federation of Labor in Scranton, Pa., Samuel Gompers was re-elected as president and Frank Morrison as secretary.

The Chicago Iron Trade in 1901.

BY GEORGE W. COPE, CHICAGO, ILL.

The course of the iron trade during the past year has been such as to mislead many experienced manufacturers and merchants. Usually, commercial influences of a well defined character indicate what the probable course of trade will be for some considerable time in the future. The crop situation, the general condition of prosperity in leading branches of industry, national legislation, the labor outlook, financial conditions and occurrences in foreign countries all have a bearing on business prospects, and any one of them may, to a considerable extent, afford some clew by which a business policy can successfully be directed. The year just ended has been marked by several events regarded at the time as adverse in their bearing, but those who shaped their policy in accordance with such a view found their judgment at fault. Looking back, it can now be seen that those who had greatest faith in the prosperity of the country and greatest confidence in the solidity of prices and who bought without hesitation came the nearest to reading correctly the signs of the times.

The Chicago Iron trade was undoubtedly more active in 1901, and the quantity of iron and steel consumed in the district tributary to Chicago was much larger than in any previous year. Periods of greater excitement, of more reckless buying and of decidedly greater fluctuations in prices have been seen, but it can be truthfully said that in no former year was the movement so well sustained in all lines and the demand from consumers so continuously heavy. The fluctuations in prices in 1901 were quite narrow except on a few finished products, and these were mostly such products as were made very scarce by the long strike in the United States Steel Corporation's mills, extending through the summer months. The range of prices was small, even in pig iron, notwithstanding the fact that occasionally the pig iron market took on an appearance of decided weakness, when buying happened to be suspended for a time. It was a remarkable year considering occurrences of this character, for whenever buyers began to be convinced that prices were seeking a lower level the situation would change and firmness would develop.

The Strength of the Steel Trade.

The peculiar conditions which in this way marked the course of the year are believed to have been due to the sustained demand for steel and steel products. This demand overbalanced any falling off in other branches of the iron trade. It thus happened that weakness might develop in foundry pig iron or in bar iron, and at the same time steel making pig and steel billets would be practically out of the market. Ordinarily weakness in one or two branches will affect the rest of the trade, but in the past year the strength of the steel trade was too great to be overcome by any temporary disturbance in iron products.

The strength of the situation in the steel trade may be largely ascribed to the remarkably prosperous condition of the railroads. In no preceding year had the railroads been such heavy purchasers of all kinds of equipment and supplies. They filled the steel rail mills with orders to overflowing. They kept the locomotive works and car shops crowded with orders, and at the same time built as many locomotives and cars in their own shops as their facilities would enable them to do. Their purchases of miscellaneous supplies exceeded anything before known, so that numerous branches of trade not ordinarily dependent on railroads for their business were greatly stimulated by this addition to their usual line. It is difficult to conceive what would have been the general condition of the railroads the latter part of the year if the traffic had not been checked to some extent by strikes involving important industries, and by the serious fail-

ure of the corn crop in some of the States whose business contributes to a large extent to the commercial importance of Chicago. As it was, the facilities of the railroads were not equal to the traffic pouring in on them in the last half of the year.

Some Early Adverse Conditions.

The year opened with conditions indicating considerable irregularity, in comparing the various branches of the iron trade. The steel works, for instance, began the year with a large tonnage of orders booked, particularly for steel rails and other products entering into the requirements of railroads. Prices in such lines were accordingly very firm. In pig iron, however, especially foundry grades, the consumption, though large, was not sufficient to take up the current output, and before the first quarter of the year had passed concessions were made to secure orders, and some of the Southern furnace companies offered considerable inducements to buyers. Weakness also appeared in plates, and in some other rolled products of a staple character supplying the manufacturing trade. About the time when the outlook grew ominous, and lower prices seemed to be inevitable, the crop reports indicated a record breaking yield of winter wheat. This greatly encouraged manufacturers of agricultural implements, who constitute so large an element in the manufacturing activity of Northern Illinois, and heavy contracts were placed for materials, which, in some instances, extended well into 1902. Not all of the heavy buyers could be induced to cover their requirements, however, as some of the most experienced felt uneasy because of the riotous stock speculation which was then in progress. When the great stock panic on Wall street of May 9 occurred, the conservatives regarded themselves as wise in not having taken on heavy commitments for materials. The stock panic, however, speedily became a mere reminiscence and apparently had no effect whatever upon general business. Fresh courage was, in fact, imparted to manufacturing interests, because this was taken as proof that the business of the country was on such a solid foundation that no mere speculative catastrophe could affect it. Business then continued in good condition, being assisted materially by the organization of the United States Steel Corporation, which had been effected in March and removed for a time some elements of friction that had appeared. Some prices of finished products were advanced, notably rails, plates and sheets. The outlook continued exceedingly favorable, and business was very active until well toward the middle of the year, when apprehension began to be created by drought conditions affecting the States in the Southwest. These conditions instead of disappearing were protracted, and other States as far east as Ohio fell under the same malign influence, and it was seen that the corn crop of the country was marked with possibly total failure. The damage, as usual, was considerably overestimated, and much greater uneasiness was caused than actual conditions warranted. Nevertheless, the shortage was sufficient to create apprehension relative to the earnings of Western railroads, particularly those running through the corn growing region.

The Great Steel Strike.

In July the great strike, popularly known as the steel strike, occurred in many of the works belonging to the United States Steel Corporation. The works in the immediate vicinity of Chicago which were closed by the strike were the Joliet and Milwaukee plants of the Illinois Steel Company and the Joliet and Muskegon plants of the American Tin Plate Company. Every effort was made by the striking workmen to induce the employees of the South Chicago Works of the Illinois Steel Com-

pany to join them, but greatly to their credit these employees refused to violate the agreement under which they were working, and which covered the whole of 1901. Although the strike thus closed but a few establishments near Chicago, its effect was severely felt in cutting off much of the supply of sheets, tin plates, wrought pipe and hoops manufactured in the mills of the corporation at Pittsburgh and elsewhere, which had been closed by the strike.

The stocks of bars, hoops, sheets and tin plate had been so depleted by the protracted strike in 1900 that the mills were run to their full capacity during the following winter to supply the demand from manufacturing consumers and merchants. It required several months to enable the bar mills to catch up with the necessities of the trade. The hoop, sheet and tin plate mills were taxed beyond their capacity, and the trade had not been stocked when the strike of 1901 was precipitated. Tin plate was not advanced by the manufacturers, but sheets were forced up sharply by the heavy demand, an advance of \$4 per ton being made in February and another advance of \$4 in March. In July, in the face of the strike and despite the lack of adequate stocks in consumers' or jobbers' hands, a reduction of \$6 per ton was made by the American Sheet Steel Company. This prevented the independent mills from reaping as great profits from the strike as would otherwise have been the case. After the strike had continued for a month and no prospect of an early settlement was seen, the independent mills and the jobbers began to advance their prices, and before the strike ended sales of carload lots of No. 27 sheets were made as high as 4 cents, Chicago. For a time important manufacturing consumers were so greatly in need of this class of material that they were obliged to draw on jobbers' stocks. The elbow and stove pipe trade was particularly hampered by the lack of sheets. Tin plates, hoops and wrought pipe also became very scarce and jobbers' prices were sharply advanced. After the strike ended the supply of pipe gradually improved until the trade was well supplied, but a shortage in sheets, tin plates and hoops was manifest for the remainder of the year. This strike at the same time cut down the production of steel and reduced the supply of steel available for the general purposes of the country during the fall months. After the strike had ended the heavy demand for the special products affected by the stoppage of works undoubtedly to some extent offset the effect of the drought, as it prevented business interests from associating with the corn crop shortage any falling off in trade or decline in prices.

It will be seen from this brief presentation of the course of events having a direct bearing on trade that those who sought to be guided by actual occurrences in mapping their plans for future operations were subjected to puzzling cross currents and counter influences. During the fall months those who had bought sparingly early in the season found that not only were they unable to purchase additional supplies as cheaply as they might have done in the spring months, but they were actually compelled to pay advanced rates. The excellent condition of business during the fall months so greatly overtaxed the equipment and terminal facilities of the railroad companies that much interruption to business was caused by the scarcity of cars, which interfered with both the receipt and delivery of materials. Probably the most serious feature of this condition of affairs to Western manufacturers was the inability of the manufacturers of coke to furnish their customers with regular supplies of fuel. This caused blast furnaces to be frequently banked and greatly hampered foundrymen.

Notable Additions to Capacity.

The consumption of iron and steel in Chicago and its vicinity has in late years been increasing much more than the local production. For various reasons manufacturers have been slow to increase their productive capacity, notwithstanding the fact that the market has been steadily expanding. Outside sources have thus been drawn upon for supplies of pig iron for the foundry trade and steel billets for manufacturing consumers who

do not produce their own material, as well as for many forms of finished iron and steel. The local market has therefore been dominated by outside influences more largely than during the first half of the past decade. This condition of affairs is now in process of adjustment, and the additions to productive capacity which have been made during the year just closed and others which are now under way and will soon be completed will go far toward making Chicago more independent in this respect. Among the improvements which have been made are the erection of two large blast furnaces by the Illinois Steel Company and one furnace by the Iroquois Iron Company, all at South Chicago. The Minerva Furnace at Milwaukee is being rebuilt and enlarged and will add to the local supply of foundry iron. These additions to blast furnace capacity will represent an increase of about 1300 tons daily in the rate of production.

The Inland Steel Company are erecting a large open hearth steel plant at Indiana Harbor, Ind., which is just outside of the city limits of Chicago. In the line of finished products the starting of the Waukesha Sheet Steel Works, at Waukesha, Wis.; the reopening of the Muskegon bar mills, at Muskegon, Mich., by the American Rolling Mill Company and the establishment of a rolling mill for the manufacture of angles and other small shapes by the Deering Harvester Company of Chicago are noteworthy additions to the local producing capacity.

In the last annual review mention was made of a projected structural steel plant to be undertaken by the Illinois Steel Company. This plant would probably have been built if the Illinois Steel Company had not been absorbed by the United States Steel Corporation. Several steel plants are contemplated by Chicago manufacturing interests, which will probably develop into actualities if the steel situation continues for any length of time in its condition of apparent inadequate supply. New works for the manufacture of wrought pipe were started by the Mark Mfg. Company at Evanston, Ill., and by the Aermotor Company at Chicago Heights, Ill.

Numerous establishments involving the consumption of increased quantities of iron and steel have been completed during the year, among the most prominent of these being the American Malleable Casting Company at Chicago Highlands, Ill., with a capacity of 15,000 tons per annum. The activity in the increase of foundry capacity was one of the most notable developments of the year. The tendency of consumers of castings to add foundry departments to their works has been quite marked.

Consolidations.

The consolidation of manufacturing interests has not been checked, but the year has seen quite a number of important developments in this line. Allusion has already been made to the United States Steel Corporation. The formation of the American Can Company involved the absorption of large establishments manufacturing tin cans and packages, as well as important machinery plants engaged in the manufacture of presses and other machinery for can making. These establishments have been withdrawn from the general trade and are being operated exclusively in the interests of the American Can Company.

The organization of the Allis-Chalmers Company was another event of moment which particularly interested the machinery trade. The company as now constituted form one of the greatest undertakings in the machinery line in the world. A movement which attracted some attention during the year, contemplating the consolidation of malleable foundries, was not successful and has apparently been dropped. An effort was also made to revive the attempt to consolidate stove foundries, but it likewise proved impracticable and nothing has been heard of it for some time. The same fate evidently befell the proposed consolidation of plow manufacturers and the plan to make a greater consolidation of steel casting plants.

The Building Trade.

As Chicago suffered heavily in 1900 from paralysis in the building trade, owing to the protracted disagreement between builders and the trades unions, so in al-

most corresponding degree was the business of the city benefited by the better prevailing conditions prevailing in 1901. The building trade was almost wholly free from labor disturbances and the building interests enjoyed one of the best years ever known in the history of the city. The erection of large business structures was resumed, and activity was extraordinary in the erection of apartment buildings and dwelling houses. This brought about a welcome revival in the demand for all kinds of building materials, involving the consumption of great quantities of iron and steel. The outlook in this direction is exceedingly bright for the coming year, as important building projects are now even more numerous than they were at the beginning of 1901.

Deferred Business.

Much of the activity in the demand during the year can be ascribed to deferred business, which had been accumulating during the previous year or two. For instance, the more reasonable prices prevailing in 1901 caused agricultural interests to purchase wire fencing much more heavily and to make improvements which had been contemplated for some time, but were deferred for a period of lower prices than those ruling in 1899 and 1900. These improvements would very probably have been postponed still longer if agricultural interests had not been placed in excellent financial condition through fine crops for several successive years and the good prices obtained for these crops, both at home and abroad. The year was unprecedented in the demand for barb wire and woven fencing. The great consumption of wire in these directions caused a scarcity of wire for a time which proved a cause of constant annoyance to all interests, from manufacturers to consumers. The wire manufacturers have now increased their facilities probably 25 per cent. over their condition at the beginning of 1901, and it is expected that the trade will be promptly supplied during the coming season.

The Machinery Trade.

A feature of Chicago trade which cannot be overlooked has been the remarkable activity in the demand for all classes of machinery. The manufacturers and dealers have enjoyed a magnificent year in every respect. Some exceptions may be noted, particularly in the case of such machinery establishments as were most affected by the machinists' strike, precipitated in May. This strike at first promised to be a very serious matter, but fortunately it was not of long duration, except in two or three establishments on which the efforts of the machinists were concentrated in the hope of being able to secure results favorable to themselves, which would have a strong bearing on future movements of this character. The machinists were defeated, the defeat being particularly decisive at Milwaukee. The efforts to prolong the strike in Chicago, while they caused great annoyance, were nevertheless unsuccessful in accomplishing their purpose. This strike, while important in some respects, was not of sufficient consequence to affect the generally satisfactory condition of the trade. In fact, during the time it was in progress the machinery trade continued in excellent condition, showing that the course of business was not being interrupted.

Closely related to events in the machinery trade was the strike which occurred in the foundries making machinery castings. The local molders' unions, in defiance of their superior officers, sought independently to secure an advance rate of wages for Chicago molders, and in July began a strike for this purpose. A vigorous contest was made by the National Founders' Association in such foundries as are controlled by the members of that organization. Some of the Chicago foundries outside of the association made terms with their men by which it was provided that the advanced rate should be paid until the strike was settled by the National Founders' Association and that the rate then established should be accepted in their foundries. The strike, however, was gradually overcome and no formal settlement was made. The consequence is that at present no uniformity exists in molders' wages in Chicago. Thus, while the strike interfered with business to some extent, it was not a serious matter for local trade, taken as a whole.

Course of Prices of Pig Iron.

A table, given hereunder, has been compiled from the quotations in our weekly trade report showing the course of prices on four of the leading grades of pig iron. Comparison has also been made with the course of prices during the preceding ten years. It will be observed that the fluctuations during 1901 were moderate. The greatest fluctuation was in Southern pig iron, which made an extreme range of \$2 per ton. The prices ruling during the year were considerably lower than those of the previous two years, but were well above the average of the six years extending from 1893 to 1898, inclusive. The table is as follows:

Months.	Local coke No. 2.	Lake Superior charcoal.	Ohio strong soft No. 1.	Southern coke No. 2.
January	\$14.75	\$19.00	\$16.12½	\$14.50
February	14.25	17.50	16.00	14.15
March	15.25	17.50	16.50	15.00
April	15.50	18.00	16.50	15.40
May	15.50	17.50	16.50	14.90
June	15.00	17.00	16.25	14.30
July	15.00	17.00	16.00	14.15
August	15.00	17.00	16.00	14.15
September	15.00	17.00	16.00	14.15
October	14.75	17.00	16.50	14.40
November	14.87	17.50	17.12½	14.90
December	15.50	18.00	17.50	15.15
Average for year....	\$15.00	\$17.50	\$16.50	\$14.60
Average for 1900.....	19.12½	22.00	20.75	18.35
Average for 1899.....	17.65	19.80	19.67	17.75
Average for 1898.....	11.00	11.60	12.00	10.45
Average for 1897.....	10.60	13.00	12.25	10.25
Average for 1896.....	11.70	13.62½	14.50	11.40
Average for 1895.....	11.80	13.75	14.25	11.75
Average for 1894.....	10.60	14.75	13.50	10.75
Average for 1893.....	12.80	16.12½	16.00	12.75
Average for 1892.....	13.90	16.75	16.75	14.00
Average for 1891.....	15.25	17.37½	18.00	15.00

Prices of Finished Iron and Steel.

A great deal of interest is always taken in the prices of such staple articles in finished products as merchant iron and steel bars, angles, machinery steel and open hearth spring steel. For this reason prices have been compiled from quotations in our weekly trade reports and compared with the average for the preceding ten years. The fluctuations on these items during the year ranged from \$3 per ton on spring steel to \$5 on other products. It will be seen that the average prices on bar iron and soft steel bars for the year were the same. The prices prevailing on these products for 1901 were considerably lower than those ruling in 1900 or 1899. The table, which is based on minimum prices at Chicago for shipments from mill, is as follows:

Months.	Common bar iron.	Soft steel bars.	Angles.	Smooth machinery steel.	Open hearth spring.
January	1.45	1.40	1.55	1.75	2.15
February	1.45	1.45	1.55	1.82	2.15
March	1.55	1.55	1.55	1.97	2.15
April	1.60	1.65	1.75	2.00	2.30
May	1.55	1.60	1.75	2.00	2.30
June	1.55	1.55	1.75	2.00	2.30
July	1.55	1.55	1.75	2.00	2.30
August	1.60	1.65	1.75	2.00	2.30
September	1.62½	1.65	1.75	2.00	2.30
October	1.70	1.65	1.75	2.00	2.30
November	1.65	1.65	1.75	2.00	2.30
December	1.65	1.65	1.75	2.00	2.30
Average for year....	1.58	1.58	1.70	1.96	2.25
Average for 1900.....	1.75	1.75	2.00	2.25	2.80
Average for 1899.....	1.80	1.90	2.00	2.50	2.85
Average for 1898.....	1.05	1.10	1.25	1.55	1.61
Average for 1897.....	1.11½	1.13	1.19	1.53	1.66½
Average for 1896.....	1.30	1.30	1.40	1.62½	1.87½
Average for 1895.....	1.25	1.37½	1.50	1.70	1.85
Average for 1894.....	1.10	1.25	1.40	1.70	1.85
Average for 1893.....	1.47½	1.60	1.82½	2.00	2.05
Average for 1892.....	1.62½	1.75	1.97½	2.11	2.09
Average for 1891.....	1.70	...	2.17	2.32	2.40

Steel Plates.—The first four months of the year showed the only variations in price. During these months mill shipments of tank steel plates at Chicago ranged in price from 1.55 cents per pound to 1.65 cents, the higher rate ruling at the beginning of April. Indications of weakness then appeared but manufacturers speedily corrected this condition, and the price was advanced to 1.75 cents, and was maintained at that rate for the remainder

of the year. The plate trade was extremely active for the first half of the year, but during the last six months the local consumption was diminished by reason of a strike in an important works consuming a heavy tonnage of steel plates in railroad equipment. This strike has not yet terminated, and the consumption of plates is therefore still somewhat under the usual tonnage. The average price on tank plates for the year was 1.70 cents against 1.80 cents in 1900, and 2.50 cents in 1899.

Steel Rails.—The history of the rail trade during 1901 is a record of continuously heavy pressure on the mills, which kept them running to their maximum capacity. The output of the local mill, it can be safely said, was much in excess of that of any previous year. Much more business could have been secured by the local manufacturers if their facilities could have been increased to take care of it. The mills maintained a price of \$26 on standard sections through the first four months of the year, and on May 1 advanced their prices to \$28, which continued thereafter, and prevails at the present time. The average price for the year was \$27.33, as compared with \$32.75 for 1900, \$28.50 for 1899, \$19 for 1898, \$19 for 1897, \$29 for 1896, \$25.50 for 1895, \$25 for 1894, \$29.50 for 1893, \$31.75 for 1892 and \$31 for 1891.

Prices of Old Material.

Peculiar conditions govern the trade in old material. The consolidation of so many rolling mills in few hands has so concentrated the buying of rolling mill material that at times during the year the market was quite thoroughly under the control of the mill owners. It happened, however, that at other times, through causes which affected the supply of scrap, the dealers were able to control the prices at which material could be obtained. The control of the market was held fairly well by the consuming interests during the first five months of the year. The strikes which occurred during the summer months then affected the supply of scrap. For the ensuing four months the dealers in many cases paid higher prices than the mills offered, and accumulated large quantities of material which they were afterward able to dispose of at profitable prices. The condition of affairs again changed during the last two months of the year, when the mill owners by concerted action arranged a list of maximum prices. This caused the latter part of the year to be comparatively quiet, as the large dealers were unwilling to accept the situation and opposed the action of the mills. The following table shows the average quotations for each month of the year, based on our weekly market reports of old iron rails, No. 1 railroad wrought scrap, No. 1 busheling scrap and heavy cast scrap, compared with yearly averages for the preceding ten years:

Months.	Old iron rails. Gross ton.	No. 1 railroad wrought. Net ton.	No. 1 busheling scrap. Net ton.	Heavy cast scrap. Net ton.
January	\$18.00	\$14.12½	\$9.00	\$12.00
February	18.00	14.00	10.00	11.50
March	18.75	15.00	10.00	11.75
April	20.00	16.00	12.00	12.00
May	19.00	15.50	11.00	11.50
June	18.50	14.00	10.50	10.75
July	18.50	14.12½	10.50	10.50
August	20.00	14.50	10.50	10.50
September	20.75	16.00	12.00	11.00
October	21.00	15.75	12.25	11.25
November	21.00	15.50	11.50	11.12½
December	21.00	15.00	10.50	11.00
Average for 1901....	\$19.50	\$15.00	\$10.80	\$11.25
Average for 1900....	17.90	15.00	8.00	11.00
Average for 1899....	21.00	17.25	10.15	12.40
Average for 1898....	12.37½	11.25	6.62½	8.15
Average for 1897....	11.67	10.60	6.44	7.25
Average for 1896....	13.50	11.20	7.00	8.48
Average for 1895....	14.12½	11.08	7.67	8.37½
Average for 1894....	10.83	8.80	6.85	7.50
Average for 1893....	16.25	12.75	9.25	10.00
Average for 1892....	19.10	15.75	11.17	11.66
Average for 1891....	22.75	18.35	13.75	12.25

Melting Scrap.—The demand for heavy steel melting scrap was excellent through the greater part of the year. The increased number of open hearth steel melting furnaces caused a continuous trade in this class of material. The average prices ruling were as follows, per gross ton:

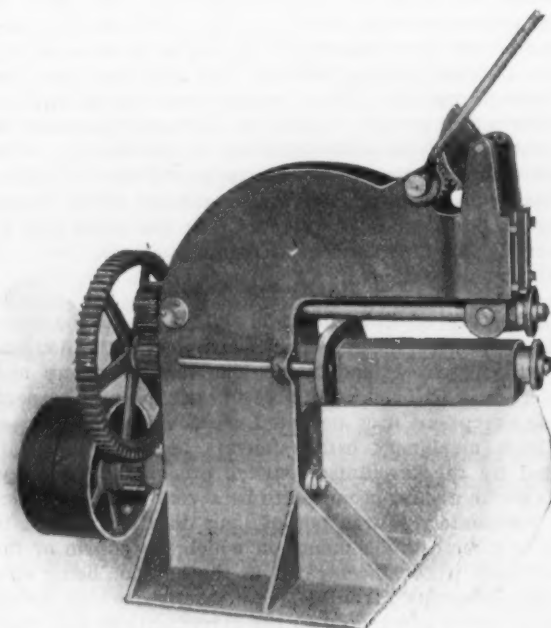
January	\$11.50	July	\$12.50
February	12.00	August	12.00
March	12.75	September	12.50
April	14.00	October	13.25
May	13.50	November	13.50
June	13.00	December	13.50

The average price for the year was \$12.85, which is precisely the same average as that ruling in 1900, and compares with \$13.25, the average for 1899.

Old Car Wheels.—The market for old car wheels was notably steady during the year. January opened with the price ruling at \$15.50 per gross ton, from which an advance was made during the month to \$16, and a further advance to \$16.50 in the beginning of February, maintaining that level until September, when the market declined to \$16, this price ruling through the whole of October, falling to \$15.50 in November, and standing at that price in December. The average for the year was \$16.20, against \$19.75 in 1900 and \$16.50 in 1899.

The Philadelphia Rotary Shears for Cylindrical Work.

The rotary shears here illustrated were designed by the Philadelphia Machine Tool Company of Philadelphia for trimming the ends of cylindrical work. The machine



THE PHILADELPHIA ROTARY SHEARS FOR CYLINDRICAL WORK.

is formed with a horn, over which the cylinder to be cut is placed. To enable the circular cutters to do the work provision is made to start the cut by forcing the upper blade through the shell by hand. The hand lever shown operates the slide carrying the outboard bearing of the upper spindle. Before starting the machine the operator pierces the sheet by pulling down this lever. He then starts the machine, and it runs the cut around perfectly square. The bearings for the upper spindle are both swiveled, and both blades are power driven.

A London paper reviews the century in a nutshell, as follows: "We received the goose quill and bequeathed the typewriter; we received the scythe and bequeathed the mowing machine and the self binder; we received the hand printing press, we bequeathed the cylinder press; we received the tallow dip, we bequeathed the electric lamp; we received the galvanic battery, we bequeathed the dynamo; we received the beacon signal fire, we bequeathed the telephone and wireless telegraphy; we received ordinary light, we bequeathed Roentgen rays."

THE NEW EAST RIVER BRIDGE:

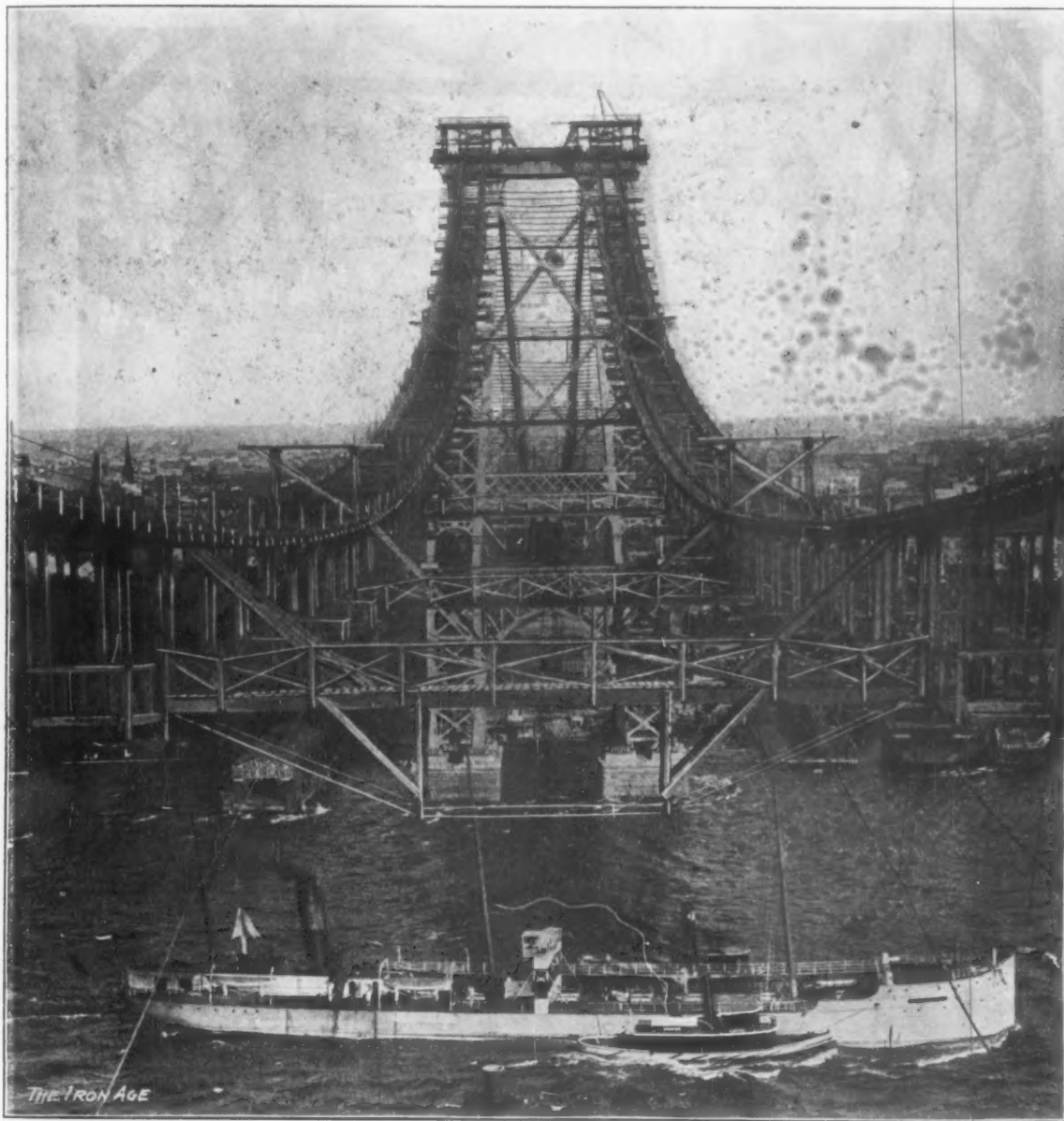
Its Present Condition Shown Photographically.

Our readers are familiar with the main features of the New East River Bridge, now being erected over the East River, between New York and Brooklyn, from articles which have previously appeared in the columns of *The Iron Age*. But it may be well to review briefly some of its principal characteristics. The center or main span is a suspended structure, supported by four steel cables. These pass over steel towers, having a height of 335 feet, and

each 11 feet wide; two foot walks, each 12 feet wide, and two bicycle paths, each 7 feet wide.

Compared with the Old Bridge.

We have no doubt that most of our readers are familiar with the present New York and Brooklyn Bridge, which was completed nearly 20 years ago, but at the same time it may be interesting to note some of the principal differences in design and in dimensions. The



Looking Toward the Brooklyn Tower.

THE NEW EAST RIVER BRIDGE.

extend to masonry anchorages. The shore spans are of the truss type of construction, built in two lengths, having a central support. These bridges are self sustaining in every way and are absolutely unconnected with the cables, whose only duty is to carry the main or central span. The main span from center to center of towers measures 1600 feet, and is 118 feet in width at the center. The entire length of the bridge between the terminals is 7200 feet, and the minimum height of the bridge over mean high water for each 200 feet each side of the center of the main span is 135 feet. The bridge furnishes two carlageways, each 18 feet wide; four trolley tracks, each 9½ feet wide; two elevated railroad tracks,

old bridge is supported upon masonry towers, while the new bridge is carried upon steel towers. The first was a complete suspension bridge, inasmuch as the cables support the center and the two end spans. This, as just stated, is not the case with the new bridge, in which the shore spans are trusses independent of the cables. The approaches to the old bridge are masonry arches and of the new bridge steel trusses. The river span of the old bridge is 1595½ feet, or over 100 feet less than the other; its width is but 85 feet, as against 118, and its four cables but 15¼ inches in diameter, against 18¾ inches. It carries only two roadways, two trolley car tracks and only one footpath.

False Work.

An inspection of the first three engravings presented shows a tremendous mass of material extending between the two towers and from each tower to its anchorage. This entire work is so-called "false," inasmuch as not one single stick of it will find place in the permanent structure. It is a necessary part of suspension bridge erection in order to provide working platforms for the stringing of the wires and their assembling into strands in the final cables. The extra cost of a bridge of this type as compared with the cantilever, which is self supporting during its entire construction, requiring no temporary work whatever, will be appreciated.

In the vertical plan of each cable for its full length

ropes extending from the point of connection of the storm cables to the tower to the lower floor of the foot bridge. At the top of each tower is a working platform about 36 x 107 feet.

Cable Making.

On top of each tower are four steel saddles, one for each cable, weighing about 17 tons each. Portions of one of these are illustrated in Figs. 5 and 7. In its upper portion it is formed with a U-shaped groove, which is curved in a vertical plane and which is destined finally to receive the cable. The groove is supported by brackets cast integral with it, as plainly indicated in Fig. 5. Each strand of each cable will be composed of 282 steel wires 0.16 inch in diameter, and 37 of these strands will be bound together to form a cable. In each

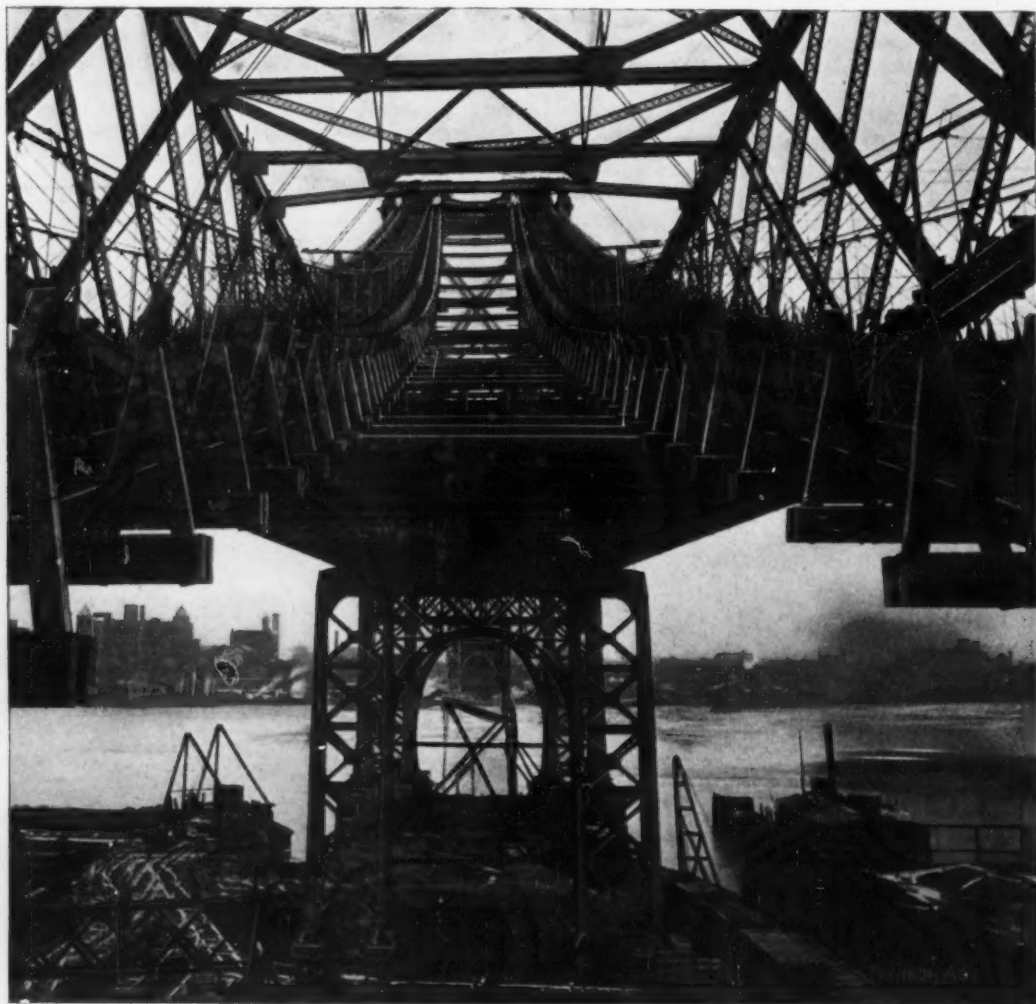


Fig. 2.—Looking Toward the Brooklyn through the New York Tower.

THE NEW EAST RIVER BRIDGE.

is a foot bridge, which is so arranged that two strands of each cable, or eight in all, can be made simultaneously. The view of the river span, Fig. 1, shows that the footbridge consists of two parallel double decked bridges, which are spaced about 70 feet apart and are connected at intervals of 160 feet by small bridges. The latter provide communication between the two systems. The upper deck of the foot bridge will be used for the construction of the strands and the lower for assembling the strands to constitute the finished cable. Each of these bridges is supported by two temporary cables, made up of three 2¼-inch steel wire ropes. Each platform is 3½ feet wide from center to center of the hand rails.

Four 2¼-inch storm cables are employed to stiffen the river span and prevent dangerous swaying in strong winds. These are attached to the towers near their base and curve upward to meet the center of the foot bridge near the middle of the span. There are also many guy

cable there will be, therefore, 10,434 wires, having a breaking strength of 20,000 tons.

Extending entirely across the bridge from anchorage to anchorage are four endless wire ropes, or cableways, so arranged as to be moved in either direction by power. One of these ropes is in the plane of each cable and each serves to carry a single wire across. The wire is carried to and fro from anchorage to anchorage, passing each time around blocks secured several feet back from the anchor bars, which are shown in Fig. 8. The different lengths of wire are spliced and the entire strand of 282 wires is made continuous throughout. During this construction the span hangs about 12 feet higher than will be its final position in the cable, and as soon as it has been finished it will be slacked away from the anchorages until it reaches the proper height to enter the cable among its fellows.

The last view, Fig. 9, shows the Brooklyn approach, which has been entirely cleared of buildings, and also

shows the traveler used in the erection of the truss work of this portion of the bridge. This traveler is composed of two hinged V-shaped arms, along the bottom chord of which extends a trolley. Power is provided for traveling the trolley, hoisting and so on by a hoisting engine, shown in the center of the picture.

America's Spheres of Influence in Asia.

BY ALEXANDER HUME FORD.

America's sphere of influence in Asia should radiate from Manila, but unfortunately we have allowed almost

the feeling against America was one of thwarted rage, but this has been gradually subsiding since the acquisition of Shantung.

France in Asia.

England and Japan welcome our entrance into Eastern politics, and would gladly leave to our statesmen the arbitration of affairs. France and Holland alone bar us out of their possessions in Asia, and when Russia has squeezed the lemon dry and denounces further alliance with France as useless to her projects, it is not at all certain that our Imperial expansionists, flushed with recent victory, will not urge our Government to head an international demand on France and Holland to open their

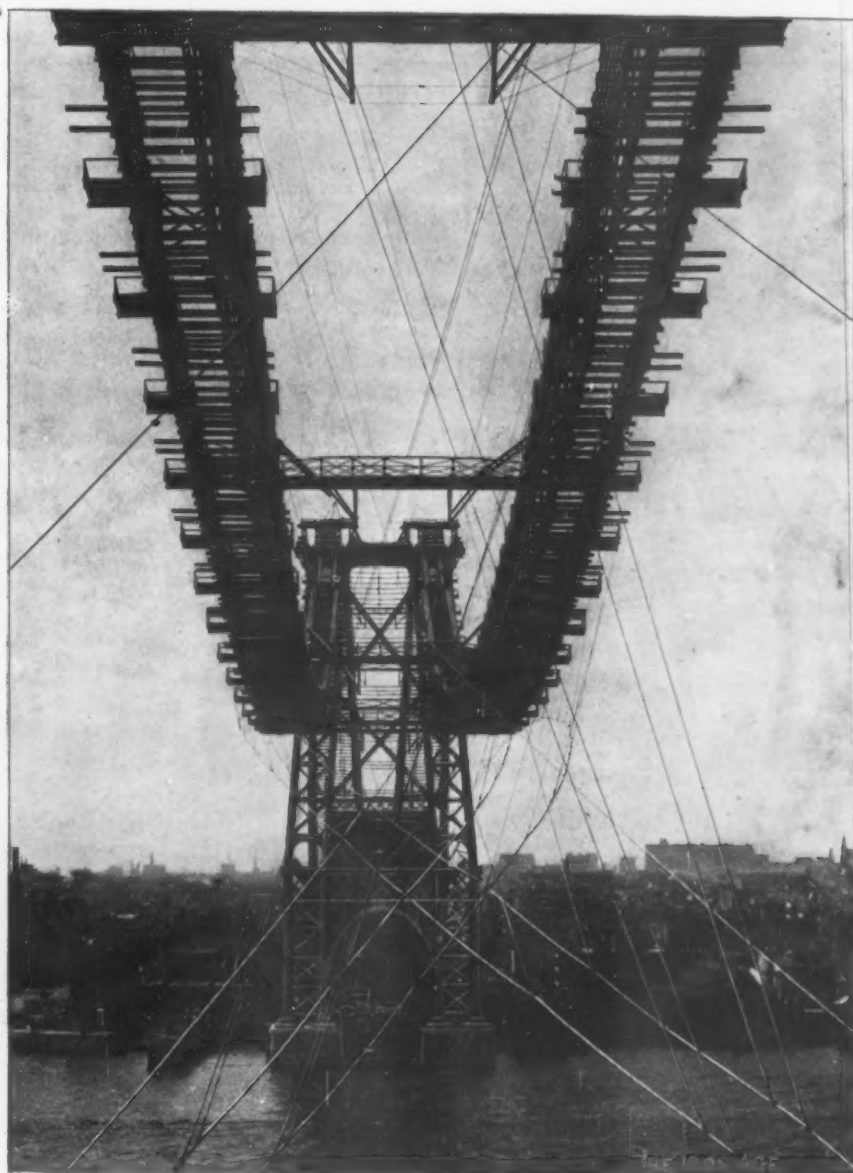


Fig. 3.—View Showing the Brooklyn Tower, Footways and Storm Cables.

THE NEW EAST RIVER BRIDGE.

every nation of Europe to get ahead of us, so that today Asia is practically apportioned among the powers. The nation last in the field is the one proving our greatest rival; the influence of Britain dwindles rapidly, but that of Germany is ever spreading, nor are the feelings of the Teutons at all cordial toward their American competitors.

Visiting aboard the vessels of various nations in the Far East, I was agreeably surprised by the cordial feelings usually expressed toward the Americans, but on one of the German men-of-war, a gunner patted affectionately the cannon under his charge and informed me that for weeks in the harbor of Manila he slept by its side at night, expecting every hour to receive the command to fire on Dewey's fleet. Among the Germans in the Far East

doors in Asia to the commerce of all nations, knowing that we would most likely monopolize these rich markets, at least until awakened Japan and China compel all other competing nations to close the doors of Asia against them, or retire ignominiously from the fields they have seized during the past few centuries.

Should any of the South China provinces fall to France our sphere of commercial influence would be narrowed accordingly, for France has hermetically sealed Indo-China against our products by not only imposing a tariff on all imports, heavier even than our own, but she also places a practical embargo on all exports, so that in 1899 while we succeeded in directly exporting to France's 25,000,000 subjects in the Far East products valued at \$100,000, our direct imports from all Indo-China, three

times as large as France, amounted in value to but \$4, gold. However, these figures by no means represent our trade with Indo-China, for on imports to and exports from France destined for French colonies there are no tariff dues, so that we send large consignments to Marseilles to be transhipped to French vessels for her Far Eastern possessions.

Notwithstanding these desperate methods to turn the trade of her colonies to the mother country, France has made a dismal failure in the Far East, Indo-China still being but a drain on the national Treasury, in spite of the millions poured into the country by patriotic French investors. The steamship line to Saigon, which receives an annual subsidy of \$1,200,000, has not been a source of considerable profit to its promoters, as even under the

ment to observe the marvelous increase in the commerce of all adjacent regions, while the total imports into Indo-China increased but 17 per cent. in as many years, and this due chiefly to the exertions of foreigners who have established factories and business houses in the colony, for the French seldom leave their homes, unless sent by the Government to occupy some official position, where they can draw a small salary and take no chances. The total annual emigration from France amounts to but 5000 persons, few of whom care to establish themselves in French colonies, where they are subject to the annoying persecutions of petty officials.

While our exports to China have increased by leaps and bounds, amounting now to more than a score of million dollars in value, those of France have remained

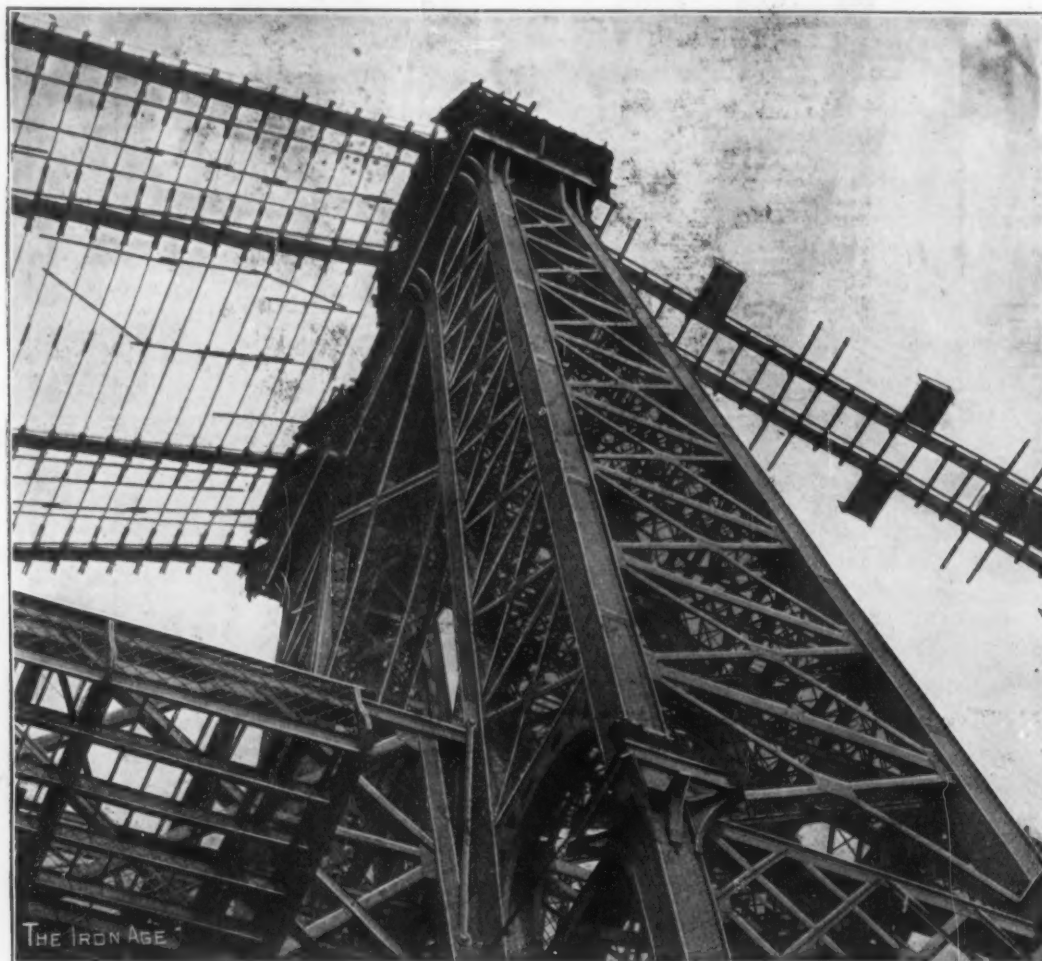


Fig. 4.—Looking Up One of the Towers.

THE NEW EAST RIVER BRIDGE.

stimulus of prohibitive tariffs France sells but \$8,000,000 worth of her products to Indo-China annually, probably including through shipments from other nations, while she receives from her colony \$11,000,000 worth of its products for home use and distribution to foreign countries. These amounts combined would scarcely pay the expenses of her army of occupation, yet, despite the fact that the French have never succeeded in planting a successful colony, her people have such confidence in the future of Indo-China that recently they subscribed in a few hours 30 times over a loan for nearly 300,000,000 francs, with which a system of railroads and canals is to be built in the favored colony. Every bit of material required for these improvements must, by law, be purchased in France and shipped to Indo-China on French vessels. In time, Hue, the capital, will be connected by rail with Bangkok to the west; Yunnan in the rich copper mountains north of Burmah, and Canton. It is to be hoped that the expectations of the French will then be realized, for in the past it must have been a bitter disappoint-

stationary at \$4,000,000 annually, being ahead of ours even ten years ago.

Siam.

Shut out of Indo-China, the nearest free port to Manila south of Hong Kong is Bangkok, capital of Siam. It is to be noted that while the commerce of France with this country adjoining her Asiatic colony is infinitesimal, ours is increasing rapidly. The trade of Siam promises to soon exceed in value that of Indo-China. Under free trade it has already risen to \$40,000,000. The progressive King has introduced many forms of industry; Americans control the electric lighting of the city of Bangkok, and are providing a part of the material and supplies for the hundreds of miles of railway which are being constructed all through Siam, and which, in time, will connect the capital with Moulemein, where the Indo-British roads will terminate on the eastern extremity of the Indian Ocean.

Russia has recently concluded a commercial treaty with Siam, and it is said is seeking to gain a foothold there as an entering wedge between French and English

possessions. It is certain that if Russia should accomplish such a coup it would greatly aid in her railway conquest of Asia, for iron lines could then be sent up parallel with the Moultelm-Mandalay route. The Russo-Chinese Bank has already loaned large sums for the building of a railroad in a southwesterly direction from Peking toward the Upper Yangtse Kiang, where it is to meet the proposed British railway, so that with Siam in her sphere of influence, Russia may yet have a railway terminus on the Pacific near the equator.

That such an event is not at present anticipated by the English, however, is demonstrated by the fact that the British magazines are not filled with awe inspiring tirades on "Russia's advance upon Australia." The French lines from Tonquin will, however, meet those of Russia in Central China, so that should the Franco-Russian alliance last until the proposed railways are completed Great Britain will be outflanked in Eastern Asia and her spheres of influence in China greatly circumscribed, while the entire commercial world would, in time, be excluded from the richest prospective market of the world, for once Russia begins her career as a manufacturing nation she will most certainly extend her exclusion policy from Europe into Asia, and find means to outwit all her opponents in the future as she has in the past.

The Dutch Colonies

How valuable to us our base in the Philippines may become in the twentieth century no one can foretell. With the frugal Dutch diplomatically forced into a treaty of reciprocity, the markets of Java and Sumatra would be opened up to us—those rich colonies that have made the Kaiser's mouth water for Holland these many years. Notwithstanding the fact that Holland keeps the trade

port duties as those imposed by the French in Indo-China, with the result that the islands sell us \$30,000,000 worth of coffee, sugar and other commodities every year, encouraging Dutch colonists to migrate to the is-



Fig. 5.—Portion of One of the Saddles.

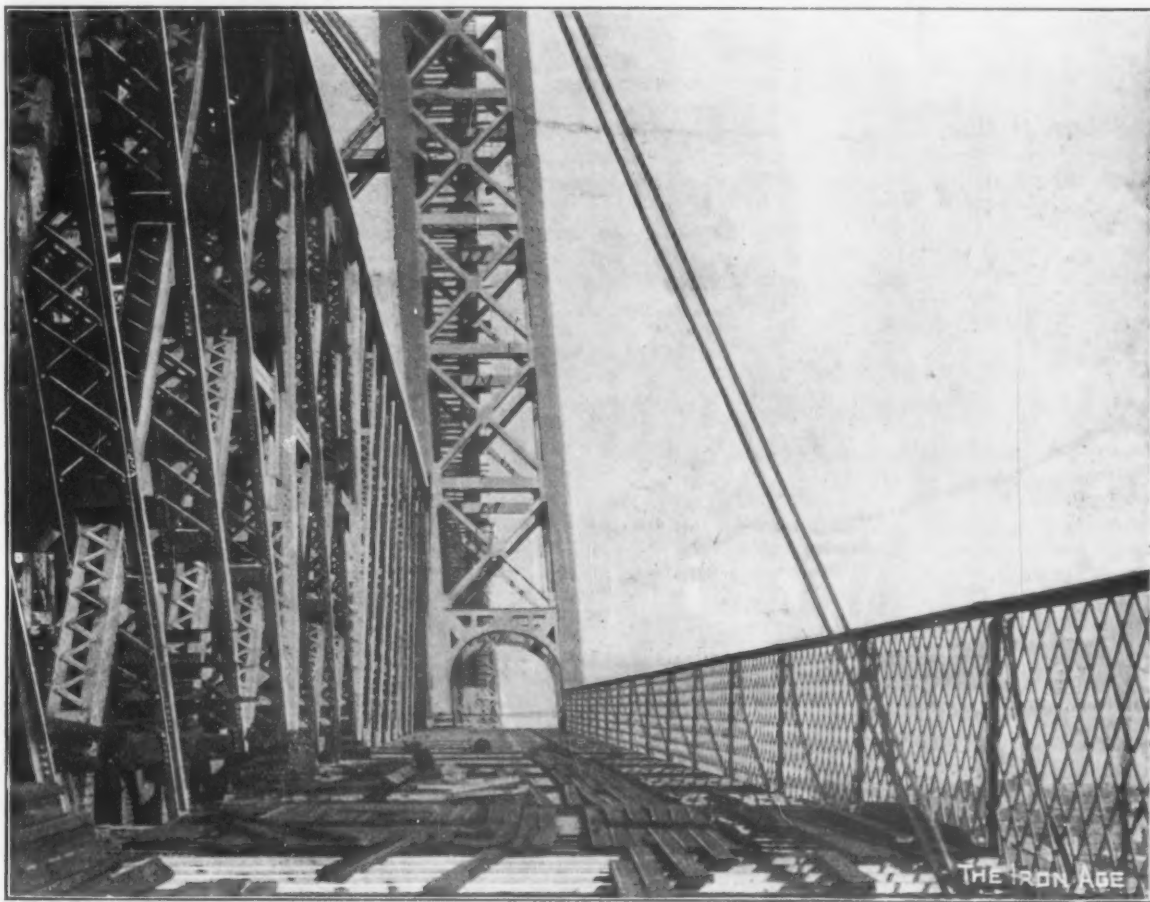


Fig. 6.—Roadway of one of the Shore Spans.

THE NEW EAST RIVER BRIDGE.

of these islands almost entirely in her own hands, we do now send the natives some \$2,000,000 worth of our commodities annually; but this is not a tithe of what we buy from them. Holland imposes no such suicidal ex-

lands and become rich at our expense. Krugerism prevails wherever a colony is controlled by the Dutch. American enterprise is excluded from Java, for no other reason than that given by the Colonial Governor: "No

foreign capital will be permitted to develop any part of the Dutch colony." Sumatra is rich in oil wells, but only Dutch capital is permitted to be invested, and Dutch subjects employed. The Americans needed to show them how to shoot the wells are hired for six months only and

she secure a Persian gulf port with a pipe line connection with her oil fields American oil would be driven out of the market; as it is, we must soon compete with China and Japan, both of which nations are developing their petroleum beds with alarming rapidity. It is not unlike-

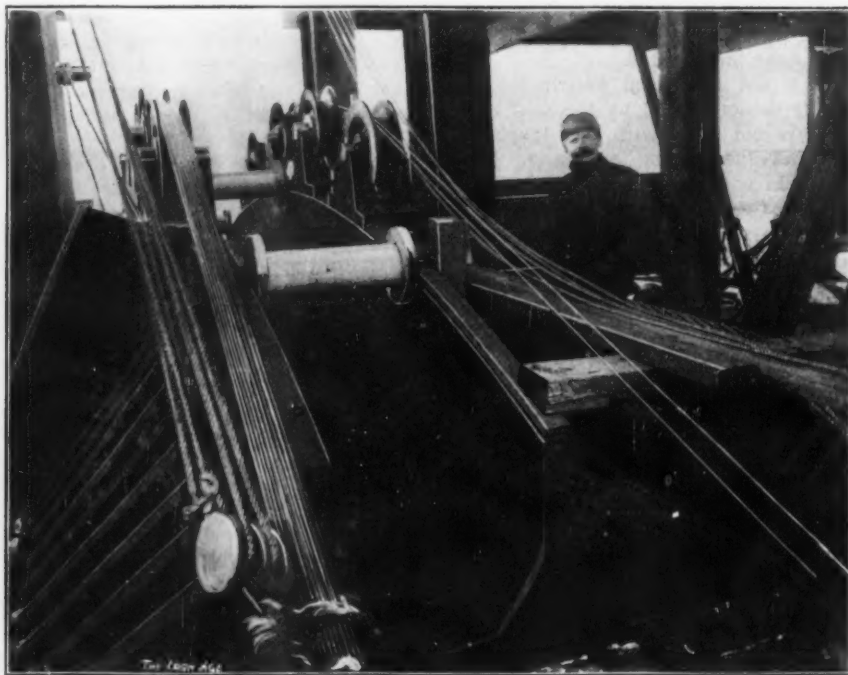


Fig. 7.—Saddle and Cable Making.

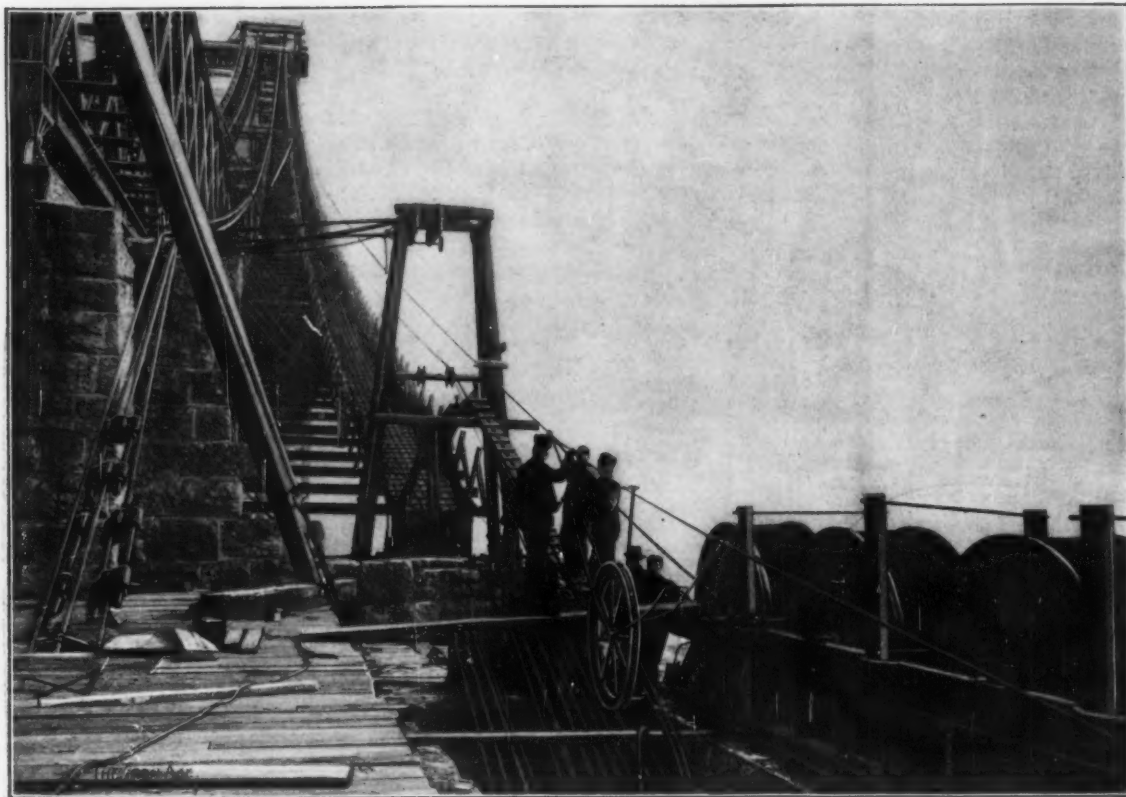


Fig. 8.—Looking from Anchorage Toward Tower. Anchor Eye Bars and Wire Reels in Foreground.

THE NEW EAST RIVER BRIDGE.

then discharged. This oil now competes with ours in every part of Asia, the annual output having risen in a few years from 3,000,000 to 20,000,000 gallons. *

We still hold our own, however, and send 50,000,000 gallons of oil to the Far East every year, but Russia sends almost as much, over 40,000,000 gallons, and should

ly that large deposits of oil will in time be discovered in our Philippines, in which case American ingenuity may be relied upon to invent labor saving machinery and devices, so that we will be enabled to undersell all competitors.

Despite the reactionary methods of Holland in Dutch

India, the islands are by far the most prosperous colonial possessions in the East. Over 1000 miles of railroad have been built, bicycle and other factories established, while the rich coal mines are being worked with convict labor, so that despite the low price of coffee, and slumps in the quinine market, Java providing three-fourths of the world's supply of this drug, the commerce of the islands of Dutch India is worth to the mother country over \$10 per capita of the native population. Should we develop the commerce of the Philippines to this extent, its value would amount to \$80,000,000 annually, while that of China, increasing in the same ratio, would be worth to foreign nations some \$4,000,000,000 yearly.

Manila has now become the rival of Batavia and Singapore. The rivalry between these two latter ports is more energetic than commendable. Goods transshipped at the Straits Settlements for the capital of the Dutch

every rumor of a British war sending freight and charter rates up to figures that seriously affect the ability of our manufacturers to compete with the prices of our European competitors, who can rely on the regularity of their national subsidized lines, and are somewhat nearer this market than we are.

India.

India has a population of 300,000,000, fully three-fourths as great as that of China, yet we send to India but \$4,000,000 worth of our products, while we annually purchase from her ten times that amount of what she has to sell, and one-third of the volume of business is through the city of Bombay, where an American trolley line is now in operation, the stock of which is owned in New York. It needs but a little vigorous effort on the part of our merchants and manufacturers to capture

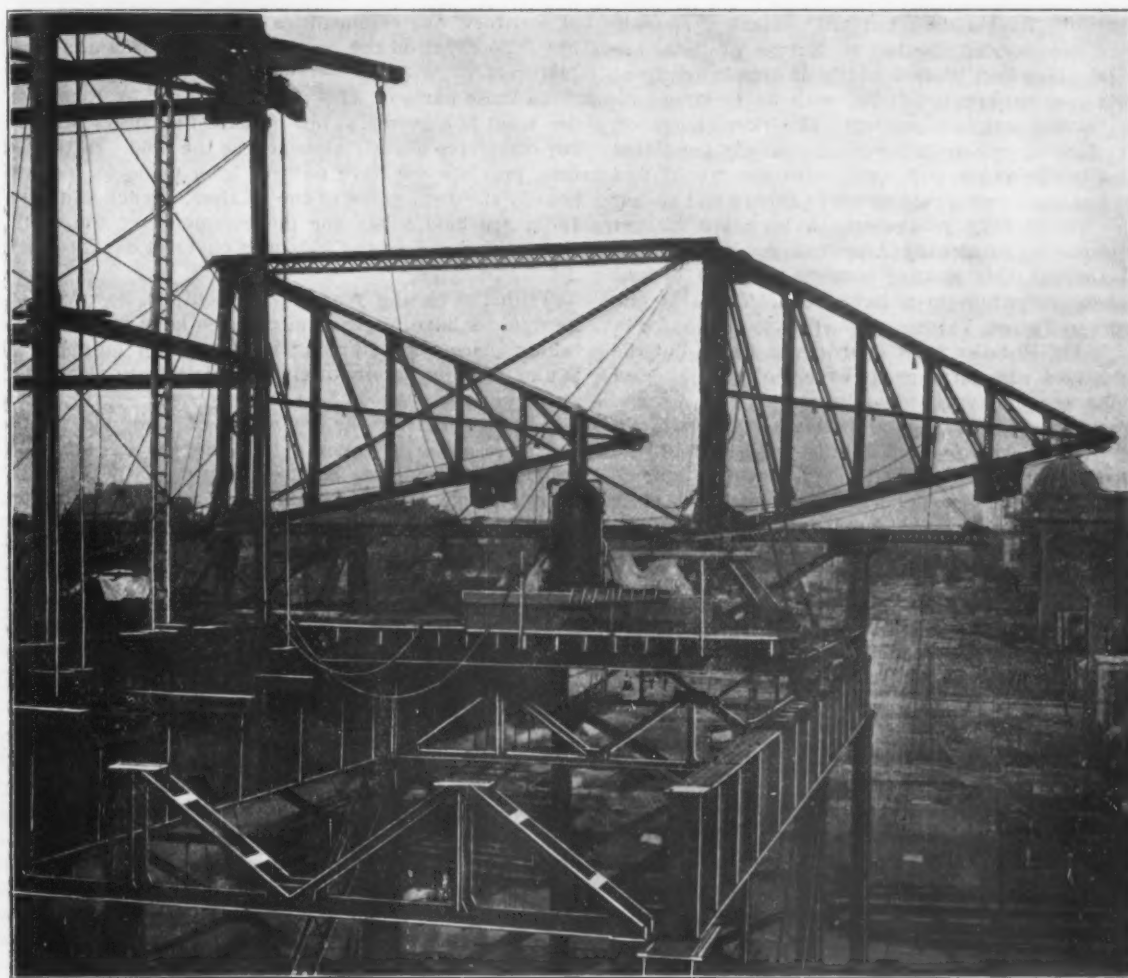


Fig. 9.—Erecting Traveler and View of Brooklyn Approach.

THE NEW EAST RIVER BRIDGE.

Indies are invariably smashed in a most mysterious manner, but this immures Singapore more than it does Batavia, for shippers have learned a lesson, and, when they can, send their goods to Holland to be forwarded to the Dutch Indies direct by the subsidized Dutch line of steamers.

England is not as industrious a colonizer as Holland, but her colonies are far preferable as neighbors, for their doors are thrown wide open to our commerce. Singapore, the gateway to India, 1400 miles from Manila, is already proving a promising market for our goods, and when the completion of the Nicaragua Canal lowers freight rates to a legitimate level we may reasonably expect to contest with Great Britain for the markets of her own colonies. While we have at present several regular lines of steamships running from our Atlantic ports to British India, these vessels are invariably English tramp steamers chartered for each particular voyage,

from England and other European nations a fair proportion of the trade of India. It is not necessary to send drummers gifted with many languages to this land; English circulars may be distributed there. The fact that the Indian Government relies on us to build the powerful dredges to deepen her rivers is an object lesson to the native merchant class. We are now successfully competing for orders for rails and equipment needed for repairs on the 25,000 miles of railway that open up India to the commerce of the world, and as a great manufacturing nation, we should be able to compete even with the Indian factories, despite the drawback of our high labor. Our success in creating a market for our flour in China should encourage our corn growers to send meal to India. It can be landed in Calcutta or Bombay and sold at a much lower figure than rice. Once the natives learn to prepare and eat it the millions who can afford neither rice nor wheat flour will gladly welcome a cheaper substitute,

and thus a new market will be opened up to our greatest cereal.

India is certainly not within our commercial sphere of influence at present. What cotton goods her mills cannot manufacture more cheaply than ours she buys from Manchester, and the English manufacturers certainly strive to retain a fast hold on the markets of the Imperial colony, as they find the trade of India, in spite of all their efforts, slipping year by year from their grasp, there is a sentiment growing stronger day by day in England favoring a protective tariff.

The twentieth century may witness a change in the commercial policy of Great Britain which may leave us out in the cold, nor would the threatened conquest of India by our most friendly neighbor, Russia, help matters for long, for India is not Manchuria, it lies nearer European Russia, and soon the Czar would put up the bars against our cheaper manufactures, and begin to foster the industries of his new subjects, for, unlike Great Britain, Russia does not only colonize, she absorbs, and her people, whether in Europe or Asia, are citizens all. However, it is doubtful if Russia really at present desires bankrupt India, with its teeming millions of famine stricken paupers. She does, however, look with longing eye upon the great sparsely populated territories to the north and west; here she would find room for her overflowing population to spread and gather strength. Thibet may yet become a lucrative market for our products, as already American goods find their way all through this strange country, even to distant parts where no white men have been. There is one treaty port in Thibet, Yatung, opened up to commerce in 1893. It is but 80 miles from Djarling, in India, but the men and mules who carry packs over the mountains on their backs consume seven days in making the journey. At present over 75,000 men and animals are engaged carrying foreign goods into Yatung, while from the west Russia sends even a greater amount of commerce by caravan into the forbidden land, much of which is originally from America. In fact, American goods are well known to the natives of Central Asia, Afghanistan, and wherever in Asia Russia has penetrated.

The completion of the Russian railway from either Tabriz or Herat to the Persian Gulf would at once make of Persia and Central Asia an American sphere of commercial influence for many years thereafter. Regardless of our friendly and even cousinly feeling toward Great Britain, America cannot remain blind to the fact that the success of Russia's intrigues in Persia would benefit our trade enormously. For a precedent it is but necessary to turn to Manchuria, where Russian predominance has made us the paramount commercial power in North China.

Arabia.

Putting aside all prejudice against Russia, it is very certain that our interest is only second to that of the Czar's Empire in securing for Russian commerce an outlet to the Indian Ocean. At present England absolutely controls the trade entering and leaving the waters of the Persian Gulf. She sends annually \$5,000,000 worth of cotton goods to the Persians through gulf ports, while India sends as much more. Once Russia connects Bandar Abbas, or Bushire, with her railway system, Persia will be opened up to the world. Our India and Manila lines can conveniently make Bandar Abbas a port of call. Russia, securing rails and equipment for her railroads in the cheapest market, will necessarily call upon us for these and other supplies. The magnificent steamers of the Russian volunteer fleet will sail for the Far East from the Persian Gulf, instead of from the Black Sea as at present. A new life will throb through every artery of trade in Persia, and England's monopoly in the gulf will be broken. Russia has the surplus population to pour into Persia, no other nation has; the development consequent upon the influx of millions of new people into a country naturally fertile, but practically deserted, will benefit the commerce of the whole world. It is true that the surrender of Persia to Russia would endanger England's hold on India, but that is a matter which does not touch American pockets, and therefore our sympathy for

our British cousins is not likely to be profound; at any rate, not until the danger becomes a fact accomplished.

With our increasing trade through the Suez Canal, Arabia is being drawn into our commercial sphere; even now we control two-thirds of the cotton trade with Aden, which is assuming large proportions, as this is the point of transshipment to the East African coast, where our cotton fabrics are ranked higher than those from any other country. Arabia sends us annually about \$2,000,000 worth of her produce, while we send about the same value in cotton goods, canned fruits, &c. Our exports have doubled in the last three years, and, despite the fact that few white men, or even Indian natives, can live for any length of time in the burning heat of Arabia, our commerce there bids fair to become of considerable value.

So far the experience of America's trade with Asiatic countries seems to indicate that wherever there is an absolutely open door, unhampered by foreign possession of territory, our commodities become predominant with but little effort on the part of our merchants and manufacturers.

In those parts of Asia dominated over by Russia, under what is a powerful but perhaps temporary stimulus, our commerce quickly monopolizes the field. In the German province we have not yet been made to feel very heavily the displeasure of the Kaiser. French and Dutch India are held solely for the commerce of the mother countries, and England bids us a cheerful defiance in India.

With the closing years of the century, however, two new forces have arisen, and changes have been and are taking place with startling rapidity. Not only has Japan entered the family of civilized nations to alarm them all by her persistent and so far successful efforts to compete with them for the commerce of Asia, but another and more powerful young giant, America, has stalked in among the plundering band of robbers in the Far East. Quietly, and scarce realizing himself as yet for what purpose, this gigantic youth is girding himself not only to attack effete Asia with mailed fist upon her Pacific side, but is also reaching out a strong arm across the Atlantic and the Mediterranean to thus, as it were, seize Asia on either side and most vigorously shake from her pockets their golden treasures. Those extended hands find that they meet a firm and assisting grasp from a would-be ally and partner—Russia.

A New Australian Cable.—On November 1 the new cable of the Eastern and Eastern Extension Telegraph Companies between Durban, Natal, and Perth, Australia, was opened for general traffic. This cable is a part of a new system of the above named companies, involving the laying of 15,000 miles of cable to connect England with South Africa and Australia. The new line has been completed between Cornwall and the Cape. The extension from Durban to Perth has been finished, as above noted, and the remaining section, between Perth and Adelaide, will be laid early next year. The new route takes in the islands of Ascension and St. Helena in the Atlantic, and Rodrigues and the Cocos-Keeling Islands in the Pacific Ocean, all of which were hitherto outside the pale of telegraphic communication. The entire enterprise was carried out without any Government assistance whatever in the shape of subsidy or guarantee.

By a resolution of the City Councils of Pittsburgh Recorder Brown was authorized to appoint a committee to consider matters in relation to the polytechnic school that Andrew Carnegie will give the city. The resolution provided that President M. G. Leslie of Common Council; President John S. Lambie of Select Council; W. A. Magee, chairman of the Finance Committee of Councils, and nine citizens should constitute the commission. The following citizens were named by the Recorder as members of the commission: Robert Pitcairn, William McConway, E. M. O'Neill, A. W. Mellon, Rev. F. R. Ruoff, President T. J. Shaffer of the Amalgamated Association, William Flinn, J. D. Callery and J. M. Guffey.

The American Machinery Trade.

With truly gratifying prospects 1902 now claims the attention of the machinery world. Before burying ourselves completely in the new duties to which the old year has left us heirs a few moments of retrospection may prove profitable. In respect to the machinery industry the year 1901 has left numerous lessons and a very great deal of unfinished work.

Labor Disturbances.

The year 1901 was a most important one in connection with the labor question. Fortunate it is that the results of the disturbances were so slight. By the majority of observers this good fortune will immediately be attributed to the new movement of organizing "the other side." Prior to the recent disagreements the strike had been a rather one-sided affair. On the labor side stood a well organized though selfishly generated army. On the other were individuals. To-day, with the various protective organizations of the employers, a strike bears the semblance of a more equal combat.

With the molders itching to find a loophole to allow them to escape the several agreements by which they were bound, the first quarter of last year found the machinists throughout the land mobilizing for a grand disruption of the peaceful state which to them had become irksome. So important were the events in this connection for almost three months following the 20th of last May that they are well impressed on the mind. Coming at a time when the employers were in fact unprepared, the result cannot be viewed as otherwise than remarkable. The machinists' strike was the grand stand play of one man, the president of the International Association of Machinists, and failed. The chief reason for its failure was the organization of the employers, which in reality was not made formidable until after the strike had been inaugurated. Events proved, however, the necessity of such organizations. They also proved the futility of an agreement with a trades union, when led by commanders who see fit to take matters into their own hands. This also proved the necessity of an organization so strong that it can not only enter into agreements, but stand behind them and force their enforcement as well.

General Mechanics' Strike Averted.

It can safely be said that it was chiefly the defeat of the machinists that prevented a wholesale strike of molders and naturally the pattern makers, polishers and other metal workers. As far as the molders are concerned, however, a great deal of credit is due the officers of the Iron Molders' Union and the Founders' Association. It is not generally known, but it is a fact, that when the machinists were tying up Cincinnati the local molders' union asked for permission to "go out" in sympathy, but President Fox forbade, because of the existence of an agreement with the Founders' Association. This is simply another illustration of the desirability of a strong counter organization. The Molders' Union was, however, not exempt from trouble, for where the men wanted disturbance very badly they had it, even though they had to rebel against their union to obtain it. The ill success with which the men have met has, however, tempered them in this respect and they are constantly learning more clearly that it is upright organizations on each side meeting on an honest level that bring about the most good for all concerned.

Production.

From a standpoint of production in the machinery industry, it has been a banner year. On all sides shops had been considerably increased in size. With the exception of the short interim of the machinists' strike everything was run full blast. At times it did look as though this was going on at a pace unequalled by consumption. But still, the close of the year found all shops working hard against orders booked. Stocks had been cleaned out, and everywhere manufacturers were behind on deliveries. The new year finds machinery builders still adding to their plants and building new

works. They are still reaching out, always expanding, and as soon as it looks as though the matter may be overdone a fresh spurt of business drowns the thought, and the only wish of the expansionist is that he had commenced a year ago, for he needs the new facilities.

An Era of Great Development.

At present there is unusual activity in the erection of tremendous engine building plants. The new Allis shops at Milwaukee will make a wonderful establishment, and the new Corliss engine plant at Hamilton, Ohio, will place Hoozen, Owens, Rentschler & Co. in a position to take a share of the monster contracts which seem to be the order of the day. Builders of heavy machine tools have been so taxed during the last year that all of their plants are being increased very materially.

Stupendous engineering undertakings are no longer subjects for doubt or apprehension. We are no sooner convinced that one of these projects that has shaken our credulity is actually to become operative than another still greater is announced. Thus we find five monster power houses in course of construction or planned for Manhattan Island, each a little bigger than the one preceding it. The latest, that to supply the electrical energy to be consumed in the Subway, is the child of 1901. It was planned and some purchases were made last year, but the new year will only witness the beginning of its erection, so great is the undertaking. Throughout the entire ensuing year this undertaking will furnish an outlet for electrical equipment and power plant appliances. It will certainly prove a handsome field for engineering study, and may give a practical test on an extensive scale to the subject of superheated steam. The boilers, which will aggregate 57,600 horse-power, and which have already been ordered from the Babcock & Wilcox Company, are all to be so built that superheating apparatus can be applied at any time.

Locomotive Building.

Locomotive building took a wide stride in advance during the year just closed. During the new year a great amount of machinery will be required by the two great locomotive building interests. The organization of the American Locomotive Company brought into consolidation a number of well-known plants, some of which, however, were falling behind the large concerns who are still outside the fold. These shops, under the new régime, are all being put on an efficient basis. Some of the work is now under way, and a large portion is still projected. For that which is now in progress a large amount of machinery, particularly machine tools, still remains to be purchased. Apropos to the organization of this company another tendency of the times may be noted. It is the presence of consumers of the company's product in the personnel of the concern. Among the interested parties in the company are to be found chiefly prominent railroad men. Going to the other side of the locomotive situation, the Baldwin Locomotive Company are extending every effort to increase the industrial hum in the center of Philadelphia. They, too, are buying machinery very heavily, and will purchase extensively throughout the entire year. The reorganized Rogers Locomotive Works, in which railroad men are also interested, may be expected to purchase machinery heavily during the ensuing year.

The Steel Car Industry.

Another new industry which is a creation of very recent years and which bears the earmarks of our accelerated industrial development is the manufacture of steel cars. Proportionate to the growth of the pressed steel car business was the activity with which other concerns sought to end the monopoly. As a result two important factors will have to be considered this year. One is the wooden car consolidation, the American Car & Foundry Company, who have gone into the steel car business. The other is the Cambria Steel Company of Johnstown, Pa. This concern, an allied interest of the Pennsylvania Railroad, are turning out a steel car of

the "built up" type. They are building a very large plant at Johnstown for the furtherance of this business. There will doubtless be additional development in this line during the ensuing year.

Shipbuilding.

Shipbuilding has experienced remarkable prosperity, and shows every indication of continuing, whether a subsidy law passes or not. An unsuccessful attempt was made during the year to consolidate a number of prominent shipbuilding plants. Like most of the recently projected combinations it proved abortive, since public interest in such investment had grown cold. Another movement somewhat of this nature sought to combine the Cramps Company with the English firm of Vicker's Sons & Maxim and an American steel company. Instead of attempting to unite a number of concerns in the same line of manufacture, what Andrew Carnegie called a perpendicular organization was planned in this instance. The idea was to provide in the new company the facilities for turning out a ship of merchant or naval type from the "bottom up," not only building the ship, but also manufacturing the materials used. The organization was never perfected. The plant which is to be erected on the Gulf Coast will prove a consumptive channel for machinery. At New London, it is probable that the plant of the Eastern Shipbuilding Company will be dismantled as soon as the two great "freighters" now in stocks are completed. This is the general impression in the trade, as the plant bears the appearance of a temporary structure. During the year all of the important shipbuilding plants have been improved extensively, and if the present naval plans of the Government are carried out further additions will be necessitated this year.

The great steel plants throughout the country, notably the Homestead works, Jones & Laughlins and the new Lackawanna Iron & Steel Company, absorbed an immense amount of machinery during the year. Extraordinary improvements were made or begun at the various plants controlled by the American Smelting & Refining Company. At all of the works enlargements were begun and a large amount of equipment went into the new plant at Murray, Utah.

Machine Tools.

In all of the operations mentioned thus far machine tool merchants were favored with orders. Speaking, however, of machine tool transactions, specifically, the year has been a good one and bright prospects are held out for the new year. In fact, a very heavy demand is expected this year, as many of the largest projects have been deferred from time to time until now the promises of closing are all based on the "early portion of 1902." The largest individual purchaser has been the Navy Department. Lists of excellent proportions have been purchased at various times, the total having exceeded any previous year. The army also proved a good purchaser, especially as regards the Rock Island requisition. Despite the long delays and unpleasant controversies over this matter, the orders were placed and they footed up to a good aggregate. The naval budget for 1902 is especially liberal. It provides for the Bureau of Steam Engineering alone \$3,865,000, to be devoted to the purchase of steam machinery and the improvement of machinery plants under the head of that bureau. For navy yards and stations the enormous figure of \$20,781,375 is estimated to cover the cost of improvements. A notable order for milling machines was taken in connection with the Rock Island Arsenal work. There were 240 in the lot and the contract was awarded to the Hendey Machine Company of Torrington, Conn.

In line with consolidations in this branch of the trade should be mentioned the absorption of the Pratt & Whitney Company by the Niles-Bement-Pond Company. This completed the line of the company and placed them in the position to furnish any machine desired in a machine shop, as well as the cutters, gauges, machinists' tools, &c., required in working with the tools.

One line which has fallen off perceptibly, and to the disadvantage of the machine tool trade, is the automobile industry. The mushroom growth with which this

industry commenced was short lived, and now practically the only concerns in the field are the important ones who are financially able to carry on the experiments required to bring the machines to an ultimate state of efficiency. The electric vehicle which started the "boom" so enthusiastically has tempered down considerably and a more solid growth is being experienced by the steam wagon.

There was remarkable activity in the building of new machine shops by the great railroad systems. Some of these shops are still to be equipped, and plans for others commenced during the year 1901 remain to be finished in 1902. As it is customary with the railroads to make appropriations for such purposes about the first of each year, a large amount of the purchasing was probably deferred pending such appropriations.

The Western agricultural implement trade has purchased machinery very heavily.

Prices Steady.

Wherever prices were changed the tendency has been upward. There were not many changes, however, values ruling very steadily. Until after the machinists' strike there were virtually no changes. The congestion of work after the settlement of the controversy offered a temptation to several machine tool builders and they accepted the opportunity. The general policy, however, has been to hold to a steady level. In the case of large engine units prices were advanced somewhat from time to time. This was chiefly due to the advance in raw materials, and at times the shops were so full of work that deliveries could not be made at any figure. Builders of high speed and the smaller classes of engines were not so fortunately situated. Competition has been keen in this trade and concessions were often necessary in order to obtain desired business. A noticeable feature of the selling end of the engine trade in New York has been the gradual tendency of New York merchants to drop the small engine business and develop the trade in heavier units. In consideration of trade conditions the cause for this is obvious.

Export Business Still Dull.

The export business during the year has steadily declined. At present there are no indications of an early resumption. With the exception of a few isolated cases where American capital and enterprise have been identified with European projects, the machine tool business has been very light. Conspicuous among the special cases referred to is the great British Westinghouse plant now in course of construction at Manchester. The American machinery purchased for this plant aggregates considerably over \$500,000. The Singer Mfg. Company of this country also purchased heavily for their Kilbowie works in Scotland. This year the Westinghouse Electric Mfg. Company will erect works at St. Petersburg, and the National Acme Company are to install a plant in England.

As to the situation in Germany, the most important development was the announcement of the text of the proposed import tariff schedule. This would prove a heavy handicap on the importation of American machinery were it adopted, and in force during a period of industrial prosperity. Whether it will be adopted is still a question. A powerful clique is working for it, but conservative German merchants are of the opinion that it will never go through, especially as it is now constructed.

The Russian tariff imbroglio has doubtless had a somewhat adverse effect on our trade with that country. Recent advices, however, point to conditions existing there that would hardly be productive of great business under any circumstances. A fair amount of miscellaneous machinery has been shipped to Mexico and the West Indies for use in sugar works. Prominent among the concerns absorbing this equipment were the South Porto Rico Sugar Company of Guanica, Porto Rico; the Chappara Sugar Company, and the Mexican Sugar Refining Company. A quantity of American machinery was also shipped to Mexican railways, principally the Tehauntepec. The Cuba Company have also taken large amounts of equipment from this country, and may be looked to for further orders, as it is not only intended

to develop the railways but also the mines of Southern Cuba.

Business in the Far East has not been very active. Matters are slowly developing, however, so that there should be the increase of trade in this direction. American manufacturers must abide by the peculiar requirements of these markets in order to capture the orders to be obtained. This is old advice, but it is still in place, as heretofore it has been largely disregarded. Educating the Oriental purchaser cannot be accomplished by a sweeping reform of methods. It must be slow, and must be done by the one who wishes to pocket the orders.

Australia has purchased a good sized equipment for the Perth Government tramways, an electric road in New South Wales. Otherwise, machinery business has not been extensive, and no large future projects are reported.

The Philadelphia Machinery Market in 1901.

The most noticeable feature in the Philadelphia machinery market during the past year is unquestionably the healthy growth of business which has been maintained during the entire period. The first few months did not develop any active conditions, and contracts were not placed as rapidly as manufacturers had hoped for, but as the year advanced business came in from all directions with a rush and the volume steadily increased, so that many manufacturers will enter the new year with business enough on their books to run their plants at full capacity for almost all of 1902.

Last year's business was in many instances exceedingly good, but it was spotty, some manufacturers not being favored with a large amount of business, while others were intermittently busy and dull. The general "end of the year dullness" in 1900 began early as November, while the same condition this year has hardly made itself noticeable. A falling off in the demand will probably take place just about the holidays, it being most natural at that time, as both buyers and manufacturers have their annual stock taking and other matters before them.

During the past year there has hardly been a branch of the machinery trade in this district which has not been running full time and at the utmost capacity. During the early summer months there was, however, considerable falling off in the demand for textile machinery, which was attributed to the decline in the demand for textile goods. This condition, however, did not extend over a long period and recovered with the movement of the stocks on hand at the various mills. The trade has not had all fair sailing during the year, several conditions having caused machinery manufacturers no small amount of anxiety and careful handling. The strike of the International Association of Machinists in May, while it did not affect manufacturers in this city generally as badly as it did at other places, affected some to a greater or lesser degree and hampered them very materially in completing partially finished goods and thereby delayed deliveries. There was for this reason some hesitancy on the part of buyers at the time in placing contracts which otherwise would have been at earlier dates.

The strike was settled in many ways; generally an individual understanding was arrived at between the employers and the men, and although in some cases, notably in the smaller shops, the men were successful in obtaining their demands, the greater number of machinists returned to work on a compromise basis or at the old terms.

The deplorable calamity at Buffalo, N. Y., which resulted in the death of the late President, William McKinley, and its adherent results, would, it was feared at the time by many, seriously inconvenience trade conditions, but owing to the firm stand taken by President Roosevelt and his determined declaration of principles the confidence of the country was unshaken and the beneficial result of his stand at that time, as well as

subsequent events, has been materially felt by the machinery as well as other trades.

Deliveries.

There is, and has been, more or less general complaint on account of deliveries of machinery and tools, particularly during the last half of the year, but the causes have in many cases been beyond the control of the manufacturers. The shortage of raw materials has been a constant one. The strike of the Amalgamated Association of Iron, Steel and Tin Workers, in the Middle West, during the summer months, did much to delay deliveries from those sources, and the continual heavy demand of the general trade upon the various manufacturers of raw materials has also been an important and legitimate cause, and the various mills have all had one of the busiest years on record. Foundries, both iron and steel, have been producing record tonnages and were all unable to meet the demands for castings with any degree of promptitude. Some manufacturers have been from one to three months in getting their castings, causing vexatious and to them unavoidable delays in making deliveries of their product. This matter, however, should, with the increased facilities of foundries and the new plants already completed or under construction, clear itself in the near future, and the early part of the year is expected to bring with it more reasonable deliveries from these various sources.

Export Trade.

Export trade has fallen off steadily during the past year, and at this time shows no immediate tendency toward recovery. Manufacturers are confronted in many cases with higher costs of raw material than they were a year ago, the wage scale has in many instances advanced, ocean freights increased during the earlier portion of the year and besides all these influences conditions abroad are not the best, owing to reported trade depressions, which have pretty generally covered the continent of Europe. The recent Russian duty on machine tools, wood working machinery and other manufactures shipped to that country has practically discontinued further exports to that most promising foreign field for American manufacturers. There continues, however, a considerable amount of exporting in some special lines, and it is to be hoped that this branch of the trade will, as soon as conditions for the same get into proper condition, be resumed in its former activity.

Improvements to Plants.

The exceedingly large demand made upon manufacturers of machinery and tools during the past year, and extending some instances for a year or more back, has compelled many manufacturers to enlarge their plants, introduce new and additional equipment and add other facilities for the more rapid and economical production of machinery and tools. This district has kept pace with others in that respect. With rare forethought and knowledge the local locomotive company have been continuously enlarging their plant, installing new machinery and making other improvements to increase their facilities. The result of this progressive movement is shown by the comparative capacity of the works. In 1899, 901 locomotives were the total output of the plant; this in 1900 was increased to 1217, and further increased in the past year to a production that will aggregate 1350 engines of the various types. This shows a gain in the present year of nearly 50 per cent. over the production of 1899, while in 1902, with the completion of various improvements now under way, a further increase of nearly 12 per cent. over 1901 is anticipated, or a total production of 1500 locomotives for the year.

The builders of electric traveling cranes have also made many improvements to their various plants and this city has probably one of the most modern and particularly equipped shops for the purpose in this section of the country, the crane department of the Niles-Bement-Pond Company, which now has a productive capacity of four complete electric traveling cranes per week.

Many other improvements to local plants could be mentioned, as nearly all have to a greater or less extent made preparations to meet the heavy demand made

upon them, and which, if present indication are of any value, will continue to be made for some time to come.

Several large plants have also begun active operations during the last year, among which may be mentioned the Tindel-Morris Company, manufacturers of steel forgings, and the Gruson Iron Works, Eddystone, Pa., and the Seaboard Steel Casting Company, Chester, Pa.

Improvements to the local foundries have been numerous, as the demands made upon them during the past year have been the heaviest on record, and the tonnage melted beyond any precedent; it has been necessary from time to time to add facilities in order to meet requirements.

The Machine Tool Trade.

The machine tool trade has been most active almost throughout the entire year. The great volume of new business emanating from new plants throughout the country, the constant increase in the equipment of the various shops and the large demand for modern tools for replacement of older and obsolete types has taxed manufacturers of these lines to their utmost. The requirements of purchasers, particularly in the lines of planers, lathes, boring, milling and drilling machines, &c., have been toward the heavier types. The nature of the work to be performed has increased in size and necessitated a corresponding increase in the size and capacities in tools. The demand in these lines has, therefore, led to the production of many tools whose sizes, weight and capabilities would have a few years ago been declared extreme and almost impossible. The standard of machine tools generally has increased and their advantages over the older tools are so pronounced that the tendency toward replacement has been materially augmented by the tools themselves.

Engines, Boilers and Smaller Tools.

This branch of the trade has been particularly active. The large amount of equipment required for the various new plants completed or in course of completion throughout the country, the general work of replacement and the extensive additions have called for many new engines, boilers, &c., and have kept manufacturers of this class of goods steadily busy at their best capacity throughout the year. The same causes and results may be said to apply to the general line of standard smaller machine tools, &c. Deliveries, however, have been in better shape generally in this line, and the volume of business has been large.

Prices.

Prices during the year have been fairly steady. Cutting in various lines has been heard of at different times, but apparently in special cases and for particular purposes, but no general reduction has been reported. The conditions in general for anything like reasonable deliveries have been tending toward advancement in prices, and we are advised that an increase of 10 per cent., and in some cases 12 per cent., and even 15 per cent. is posted for next year's business.

Outlook for 1902.

The condition for the coming year's business may be said to be entirely satisfactory. Nearly all the various manufacturers are busy, and have their order books so filled that assurances for active work range from three months up to the entire year. This is practical evidence that no other view of the outlook is apparent. The volume of inquiries even during the present month is indicative of future activity, even if only one-half of the business be placed. Railroads with the enlargement and improvement to their shops, motive power and rolling stock in view are active inquirers for prices, and in many cases have already placed substantial orders. There seems to be no abatement on the part of general manufacturers as to the extent of their requirements, and with this the equipment of many incomplete and proposed new plants makes conditions certainly look bright. The manufacturers of some lines of heavy machine tools, cranes, &c., are said now to be accepting orders only for delivery during the last half of next year, while other plants have capabilities for the entire year already taken up.

The Present Aspect of the Labor Question

BY EGBERT P. WATSON.

The problem of the twentieth century the world over is the relation of workman and employer, and strenuous efforts are being made to arrive at even a temporary solution of it, for the subject is so vast in all of its aspects that it cannot be settled by the agreements and resolutions of any body of men at one meeting, no matter how earnest and conscientious they may be. One reason for this view is that there are but very few men in the world at large who are capable of grappling with such questions and deciding them within the limits of any meeting. Judicial minds there are in plenty, but these are not usually found in the ranks of labor representatives, who must have a voice in the proceedings. From their point of view meetings are called to present considerations to-day which shall go into force to-morrow, and they are impatient of settlements which delay action. This condition is brought about by their callings, in which cause and effect are coincident; if a throttle is opened the engine must start, and legislation should be of the same complexion to meet their approval.

Another reason why the relations between employer and employed cannot be concluded at a sitting is found in the fact that up to this time the representatives of labor have not been able to "deliver the goods," as the saying is. They have agreed to certain points in controversies only to find, when they were laid before an association meeting exclusively, that the rank and file repudiated them, and, so far as they are concerned, the time of the arbiters has been wasted, for nothing has been gained except points in an empty argument between the contestants on both sides. If there are restrictions and concessions that the workmen do not like they feel that they have been overreached, and repudiate everything; then the old order of procedure obtains again. A tendency of these labor conventions, too, is that delegates from the workmen's side feel that they have the opportunity of their lives to show what is in them as orators, and, instead of keeping to the argument, indulge in vague hints and covert threats as to what they can do, and will do if affairs are not legislated to their liking. They understand conventions which settle all points claimed for the workmen, and call them "victories," but those which contain concessions upon their side they reject arbitrarily, or at the least they will not confirm and adhere to them.

This has been shown time and again at conventions which it was hoped would settle controversies of the kind mentioned for a while at least, but this seems to have been a futile hope, for if this had been the result the present convention, recently in session, would not be threshing the same straw over again. It is shown also by the more or less aggressive attitude of labor unions to those who are not of them. Independent workmen were never more harassed than they are at this writing, and in some cities in the country they have been forced to join the unions or see their families suffer. They have no choice, for in small towns the employers cannot protect themselves even, let alone help others to fight aggressions; they are in no condition to do without work, and must employ union workmen or none. There are many men, not capitalists and without shops, who take contracts and hire others to help them who belong to unions also. When the work is in progress a walking delegate comes around and inquires the price the work was taken at; if it is below the union rate for such jobs the contractor is reported to the union, and a fine of from \$25 to \$30 is inflicted on him; very often more than the profit on the transaction. The nonunion men were never in worse plight than at this time, and the outlook for their relief, right to engage where they can, is very remote. Just what benefit they will get from conventions it is difficult to see. Recognition of the abstract principle that this is a free country and every one who really wants to work can do so does not seem to help them much; all that is conveyed by the Constitution of the United States. What is urgently needed is some plan to insure the peaceable occupation of their rights, and that is now denied them.

But they do feel that at some time, more or less remote possibly, they intend to prosecute their callings in their own way, "peaceably if they can, forcibly if they must." If the various conversations that I have had with non-union men were not misunderstood by me in their purport, they are very much in earnest upon this point; what is particularly irksome to them is the fact that as individuals their views are ignored, and that under the union rules they are not allowed to even choose their own jobs. If a contractor needs workmen he cannot go to men of his trade whom he desires as hands, but must apply to the local union, with a statement of the number of men required, when the union will send them from those who are unemployed at the time. Non-union men who are compelled to join associations have no love for them and do not believe in their platforms, but "self preservation is the first law of nature" and it is not possible to exist without them.

Concerning the determination of the labor associations to rule or ruin one instance may be cited. In a certain Connecticut town of about 13,000 inhabitants, who are almost wholly operatives of one kind or another, most of them were concerned in a very stubborn strike last summer and were only defeated by the State laws enforced by an impartial judge. These laws forbade the workmen to interfere with the business of others by picketing or in any other way; when the strikers broke these laws injunctions were issued against them as a warning to desist. No attention was paid to the injunctions, but the practices of the strikers continued, whereupon they were arrested and brought into court in contempt of it. Their counsel denied and still further defied the court to punish them, which was met with summary proceedings by the judge aforesaid, who at once found the strikers guilty as charged and fined them \$500 each, issuing warrants to the Sheriff of the county to levy on the property of the strikers and collect the sums due the State. Unfortunately for the chief conspirators, as they may be called, most of them had homes for which they had worked hard a long time, and when they found that they were to be sold up they surrendered incontinently. It must not be supposed, however, that this stopped the schemes of the strikers, for at the next town election they chose the entire board of civic authorities from their own ranks, and thenceforward had, as they supposed, matters in their own control; but when the new officers assumed their seats they were found perfectly ignorant of the conduct of affairs. Transferred directly from the shop to chairs of authority they found "the seats of the mighty" harder than they expected and civic routine was at a deadlock. The treasurer announced that there was no money in the treasury and that he could not pay the policemen, teachers in public schools or any tradesmen for supplies. As these last had no confidence in the newly elected officers they would not trust the city, and for a similar reason—no credit—the banks refused to advance money, as they had previously. The treasurer was ordered by the Mayor to "go out and get some money," but as no means were suggested as to how he was to obtain it, he is, possibly, still without funds. This experience may deter other workmen from similar courses, but perhaps not, for trades unions are machines which have wheels within wheels and are slow to learn how to succeed by failure. There are always a number of hot headed members who willingly continue to butt their heads against stone walls in full faith that they can destroy them if they only keep on long enough.

It may be asked that if trades unions have no faith in conventions to redress alleged grievances, or to obtain the ends they are striving for, why do they continue to send representatives to them and spend much money to appear in them? The answer is that by attending conventions they get publicity to advertise themselves and keep before the country at large, and, further, they may gain some minor points which they had not enjoyed before. Any gain is an advance, and there is an opportunity for the trade press they control to assert that employers conceded all that was demanded by them. Trades unionists are by no means passive, but always militant toward full control of their end of manufacturing, and although no great strikes are in force at

the present time there is a condition of unrest among the trades which is constantly incited and fostered by the unions themselves. This same aspect pervades workmen everywhere, and the situation is even worse abroad than it is in this country, for in England it seems that union workmen are now deliberately loafing over their jobs and so curtailing the output that they really work but half of the time when they are in the shop, and do not even put in an appearance there for more than four days out of the six. Not only this, but the foremen have two masters to serve—their employers, who pay them for their time, and the members of the unions they must belong to, who overhaul them at meetings for what they may have ordered the members to do that was distasteful to them the day previous. The attitude toward labor saving machines is distinctly hostile; they simply stubbornly oppose new appliances in all lines of trade, and deliberately destroyed, in Northampton, a shoemaking center, some lasting machines because they dispensed with the services of three men. Wherever machines are tolerated at all they are permitted only upon a stipulation that the same number of men shall be employed as before, and the rate of them restricted to the hand labor ability, so that no advantage whatever is gained by the employers. It is stated in the *Times* (London) that a Tabor molding machine was installed in the town of Hull, and the firm offered to allow their molders to run it, notwithstanding the fact that laborers do that work in this country, but the molders refused unless they were allowed laborers in addition to their own work. As this was impossible the firm then engaged laborers themselves, when the molders promptly struck, and the matter was only settled by the interference of city officials. In the face of this and similar complications it is easy to see that dissertations upon political economy do not reach the subject and that it will take a long time to educate the work people of England to understand the questions involved.

It is also easy to say that such a state of affairs will never obtain in this country, but is that certain? Our men are too intelligent, and know the true position of labor saving machinery in the arts, for many of them have made, and are making at this writing, fortunes of greater or less sums by the aid of these very machines and processes, but the actions of trades unions everywhere, in this country as well as others, are not governed by logical conclusions or arrived at by argument, and there is no insurance that a decided stand may not be taken here against the further use of new machinery which dispenses with men.

In any event, whatever aspect matters may assume, it is most desirable that unions should by a convention or conventions of their own state exactly what they want, or what they are striving for, to the end that capitalists, or contractors, should know what they have to expect to encounter in carrying out their undertakings. Without a precise definition of intentions there is uncertainty and loss for both parties in interest, where with it there would be no obstacles to the success of any given job. This has been done before, and the platform of principles, demands let us say, promptly ignored when unfavorable conditions arose to the unions. The Amalgamated Association did this very thing last summer, as to a portion of its constituency, but another portion stood by their agreements, and arguing from this action it is not too much to feel that it will occur again and be the rule instead of the exception hereafter. Employers generally concede the abstract right of workmen to form unions to further their ends in all legitimate ways without injury to others who hold opposite views, so it is not to the unions themselves that objections are made, but to the fact that they deem it a part of their functions to dictate to nonunion men whether they shall work at all.

The New Jersey Board of Arbitration in labor difficulties has been dissolved, there being no cause for its continuation; not a single case has been referred to it during the 12 months it existed, which fact attests that it is unpopular. Conventions of a mixed character, although they may not possess the power to decide upon the facts presented, are *de facto* arbitrators none the less, and the character of the members composing the present committee should be fruitful of good, if their findings are re-

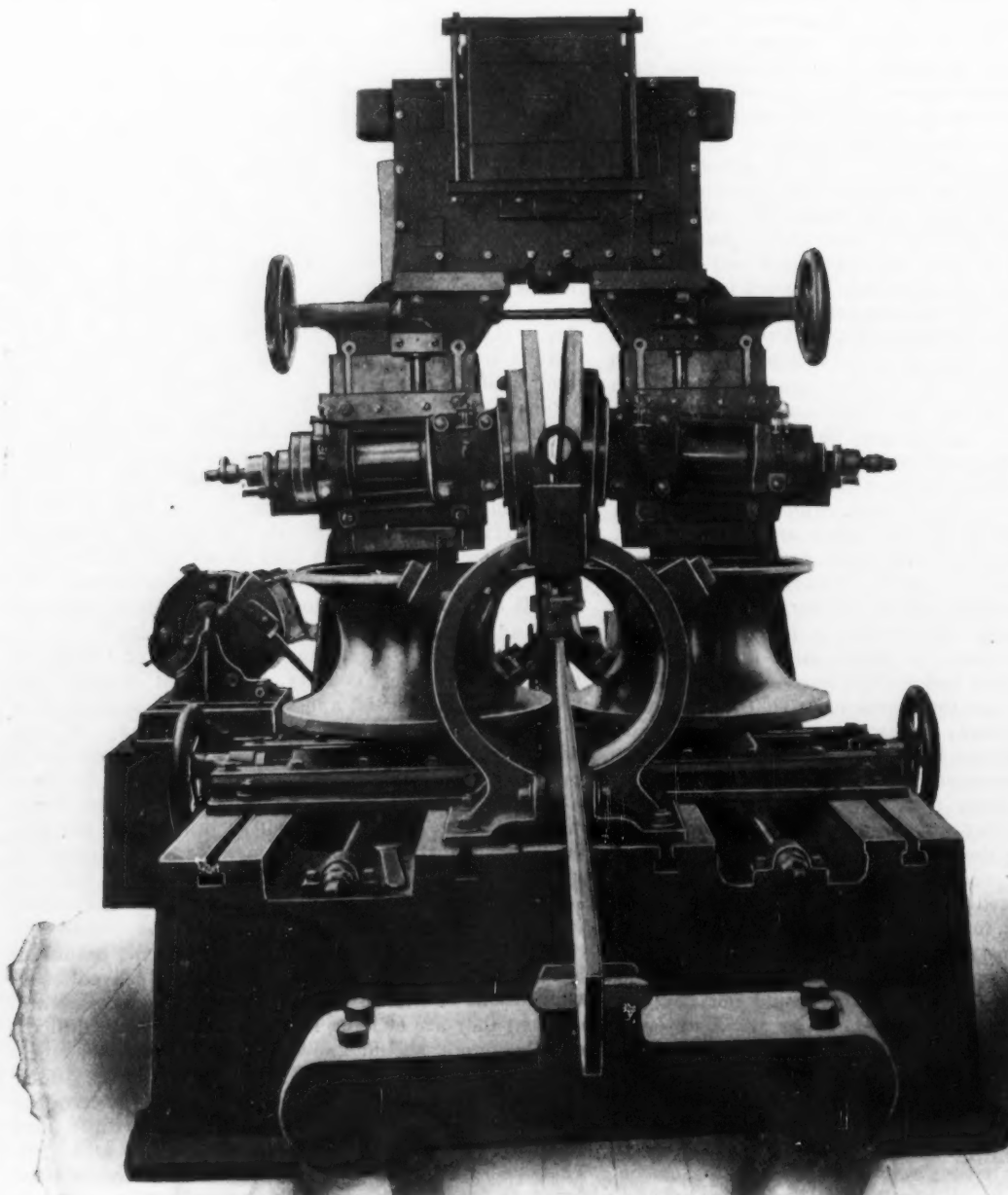
spected and lived up to. There are 36 men on this committee, 12 of whom are from union associations, 12 from the largest employers of labor, and 12 citizens without interest or affiliation with the other representatives.

It is earnestly to be hoped that their labors will bring forth good fruit.

Secretary Deane of the California Petroleum Miners' Association has published a list of 126 large firms and companies in San Francisco that have adopted oil fuel

The Wood Electric Welding Machine for Range Boilers.

The John Wood Mfg. Company of Conshohocken, Pa., have developed a machine for electrically welding the longitudinal seams in their range boilers which produces results of the greatest importance. It is well known that an electric weld, perfectly made, possesses a strength equal to, and in many instances far superior to,



Front View.

THE WOOD ELECTRIC WELDING MACHINE FOR RANGE BOILERS.

in place of coal during the past two years. The list contains the names of many of the largest industrial enterprises of San Francisco, including practically all the street railways and great manufacturing plants.

Twenty-seven new "gushers" were brought in at the Beaumont oil field during November, making a total of 110 active wells now in the field. More pipe lines were also laid last month than ever before, and the total tankage in use and under construction was increased to 1,280,000 barrels.

the body of the metal. Such being the case, it is apparent that an electrically welded range boiler should have, particularly in its vertical seam, a strength in excess of a riveted seam where a certain definite percentage of the metal is removed.

The electric welding machine by means of which these results are accomplished is simple in design and construction, and extremely rapid in its operation. In the accompanying engravings it is shown in a full front view and a partial front and side view.

The boiler plate, curved and ready to be joined, passes along a draw bench between two pressure rolls which

pinch the edges together. Upon each side of the seam thus formed by the meeting edges of the plate bears a circular copper plate, termed the contact disks. The electric current flows through these disks and the plate, the joint in the latter being heated to the welding point. This great heat and the steady, even pressure weld the edges of the plate perfectly together.

The machine consists first of a base, in the upper surface of which are T slots, in which the principal parts move and are secured. To the rear, Fig. 2, is an extension, which constitutes the draw bench portion of the ap-

paratus. The disks can be adjusted toward and from each other so as to bring the points of contact to the most desirable working position.

All operating parts of the machine are under perfect control by devices within convenient reach. The output is from 350 to 500 shells per day.

David Carlyle, special agent for the census of manufactures for Toronto and East and West York, Canada,

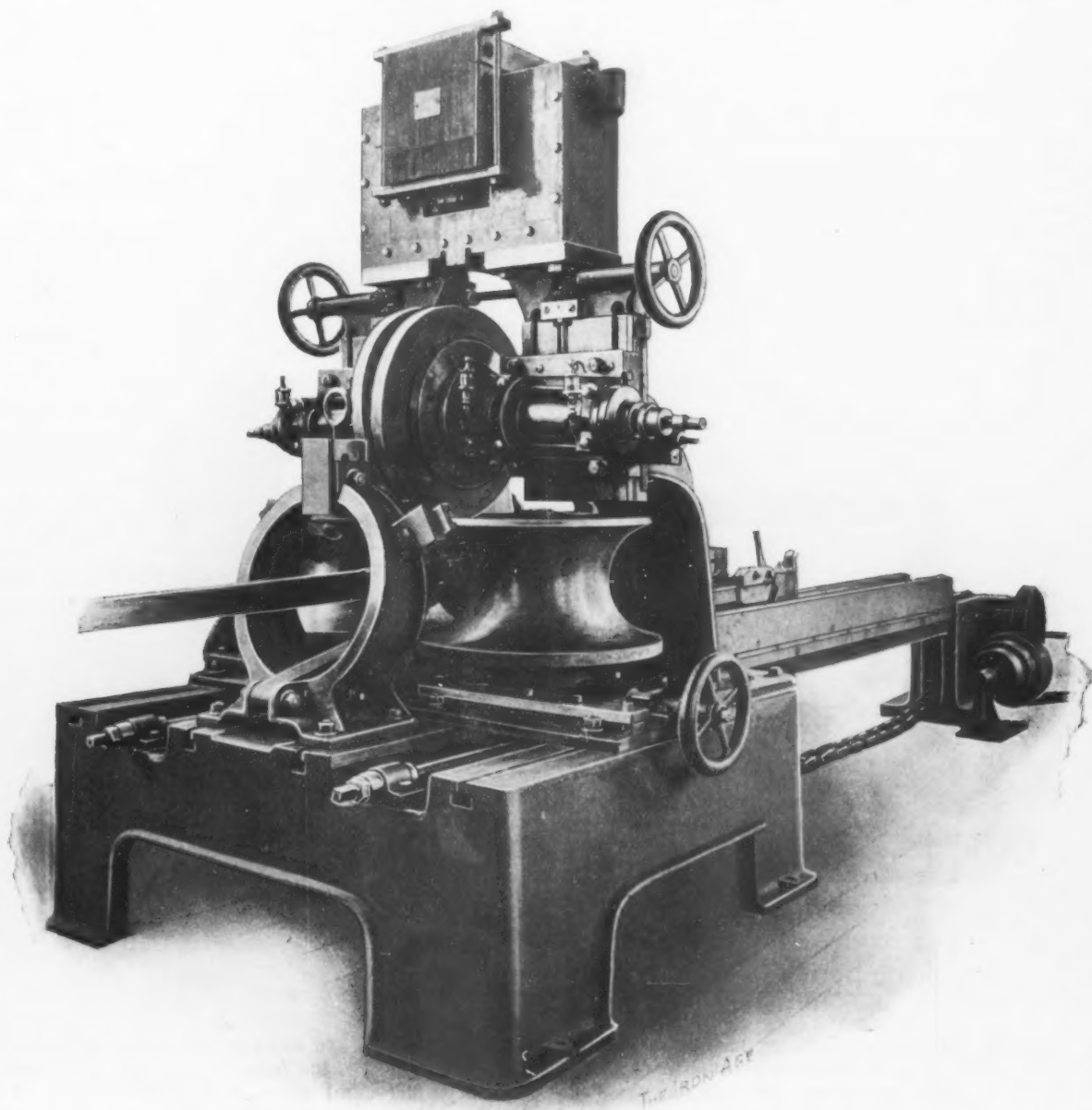


Fig. 2.—Part Side View.

THE WOOD ELECTRIC WELDING MACHINE FOR RANGE BOILERS.

paratus. Secured upon adjustable carriages on the top of the base are two vertical spindles, one each side of the center line of the machine as viewed in Fig. 1. Each of these carries a grooved pulley. The curves of these pulleys correspond with the curvature of the boiler to be welded. They can be readily removed and replaced to suit the size of pipe operated upon, and they can also be adjusted toward and away from each other for the same purpose.

It will be observed that the two copper disks are mounted upon spindles which are inclined one to the other. The result is that the disks occupy a position like the sides of the letter V. The points of the disks near-

est approaching each other rest upon the shell, one each side of the joint. The disks can be adjusted toward and from each other so as to bring the points of contact to the most desirable working position.

has issued a statement, which in part is as follows: "The census of the manufacturing industries in Toronto, which is nearly completed, show a very satisfactory increase over the figures of ten years ago. In 1891 the number of employees was 24,480; in 1901 the number of employees is 43,356, showing an increase in the number of employees in ten years of 18,768. The amount paid in wages in 1891 was \$9,042,125; the amount paid in wages in 1901 was \$15,398,819, showing an increase in the amount paid in wages over 1891 of \$6,356,694. In 1891 the value of the products of all the factories was \$42,489,352 and in 1901 \$58,879,875, showing an increase of \$16,591,523."

The Putnam 200-ton Hydrostatic Car Wheel Press.

RAM PRESSURE OF 200 TO 300 TONS—TRIPLE PUMP WORKING ONE,
TWO OR THREE CYLINDERS—ELECTRICALLY DRIVEN.

The 200-ton, 50-inch hydrostatic press for forcing car wheels on and off the axles, here illustrated, was designed and built by the Putnam Machine Company of Fitchburg, Mass. The machine is self contained, being built upon a rigid base plate, which serves as an unchangeable foundation for the superstructure. It is practically noiseless, operates with rapidity, ease and safety to its maximum capacity, and its reserve power is largely in excess of the requirements.

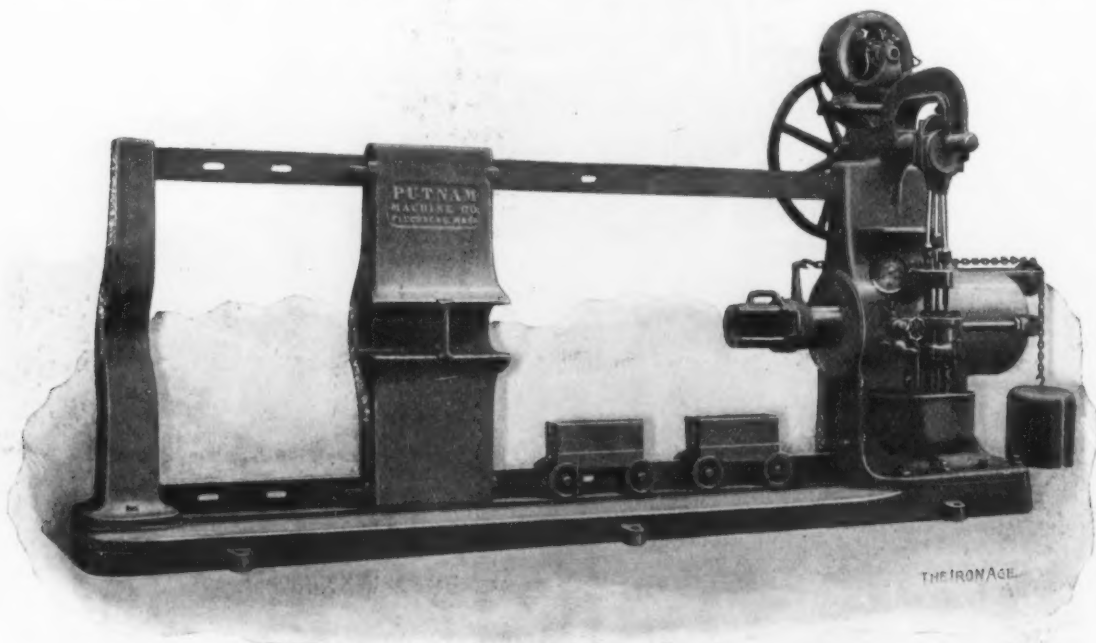
The cylinder is made of a special high grade iron, and is cast in a dry sand mold. It has a copper lining spun and seated by an improved method, which insures safety from corrosion, percolation or leakage.

The ram is 9 inches in diameter, 41 inches long, has a traverse of 25 inches and is supported by an extra long cylinder bearing. The movement of the ram in starting, stopping and returning is instantaneous, and at all times is under the control of the operator. With all the pumps

frame. The quick acting, or largest plunger, may be set to exert a pressure of 5 to 50 tons on the ram and then become inoperative through the action of an improved automatic let off. The high pressure plungers operate in reverse order, thereby imparting to the ram a steady motion of twice the velocity common to single plunger high pressure pumps. The pumps are so arranged as to permit the ram to be retarded as the pressed wheels approach the limit line. The pump is furnished with a recording pressure gauge graduated to pounds per square inch, tons on the ram and locked pressure indicator; there is also a stop valve and locked safety valve to prevent overloading.

The transmission of power from one plunger to the next higher is accomplished by means of what is practically a by-pass, which is shown in section in Fig. 6, in which the passages are clearly defined.

The drawing, Fig. 8, illustrates the automatic let off



THE PUTNAM 200-TON HYDROSTATIC CAR WHEEL PRESS.

in operation the ram advances 24 inches per minute. With the two high pressure pumps in action the speed of the ram is $9\frac{1}{2}$ inches per minute, and with one pump the advancement is $4\frac{1}{4}$ inches per minute.

One of the most essential features of the plunger is the packing, which is shown in Fig. 2. In a recess in the inner end of the plunger is placed a leather packing. This is cup shaped, the edge, which bears against the cylinder wall, being beveled, as shown. Placed within the packing and arranged so as to bear against the beveled portion are segmental rings, which are forced outward by springs acting against plungers, which in turn bear against the ring segments. This construction insures the contact of the packing with the cylinder at all times. With the lightest pressure, or even with no pressure at all, the contact is maintained, the result being that all leakage is obviated.

The pump is built of gun metal and is composed of three cylinders, A, B, C, Fig. 3, which may be run singly or combined. They are driven from eccentrics mounted upon a shaft extending across the top of the power end of the press. On the end of this shaft is a spur wheel, which takes the place of the pulley D employed when the machine is driven by power. Engaging with this spur wheel is a pinion mounted upon the shaft of the armature of the electric motor located on top of the

above referred to. In order to get the desired pressure the check nuts G G are loosened and the step C, which acts upon the spiral spring E, is adjusted until it exhausts at 15 tons pressure. The check nut D, which prevents the step C from turning, is then tightened. The nuts G G are moved until a slight play can be felt between the lever A and the collar B. When the ram pressure reaches 15 tons it forces back the valve F, which causes the lever A to drop through an angle of about 45 degrees, at which position the large plunger ceases to affect the ram. The lever then holds the valve F from contact with its seat, thereby preventing vibration. To work the large plunger again it is simply necessary to raise the handle until the check screw H rests upon the check screw I. The check screw H and I must at all times be so adjusted as to barely hold the weight of the handle, as the screw H must slide by the screw I when the handle is falling.

The above only applies when pressing on wheels. To remove wheels they are first started by the small plungers. When the pressure reaches 15 tons the lever is raised by hand until the screw H rests upon the screw I, where it may remain until the wheel is off.

The cylinder upright and resistance post are extra strong, and the latter is steel faced on the working side. They are connected by forged tie bars. The throat post

is held in position by the tie bars, which serve the purpose of guide and stop, its entire weight being supported on the base plate through the medium of rolls, which travel on the lower bar. This arrangement relieves the top rail entirely from defective strain and prevents it from sagging, becoming twisted or crooked. The pressure of the ram is received wholly by the stop bars and not by the base plate. The rear post support for the top rail has an offset, which allows shafts or work of any length to be received and operated upon by the ram.

Wheels are placed in position by being rolled up an incline onto the wheel trucks, which instantly locate them properly in the press. The trucks are provided for changeable caps suited to fit various sizes of wheels. The improved system of pressing on two wheels at the same time enables the workman to record the actual pressure exerted on each wheel.

Scotch Iron, Steel and Shipbuilding.

GLASGOW, December 13, 1901.—The condition of the iron trade here is not improved by an advance in coal, and it seems almost grotesque that ironmasters should be asked to pay for their furnace coal 6 pence per ton more than they have been paying for months, just when things are looking worse than ever. No doubt coal owners have the excuse of an apparent scarcity of coal, but it is only an excuse, for they know full well that as soon as ever the present pressure to obtain contract deliveries is over they will be distinctly short of orders. The pressure for deliveries is to get shipping contracts away before December 31, because on that date expires the period during which exporters may claim rebate of the coal duty in respect of contracts entered into before the budget was introduced last April. Nearly all the shipping that is going on just now is against contracts, and

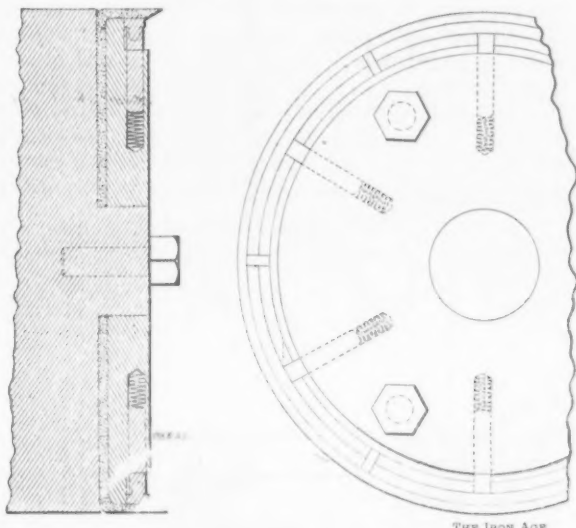


Fig. 2.—Ram Packing.

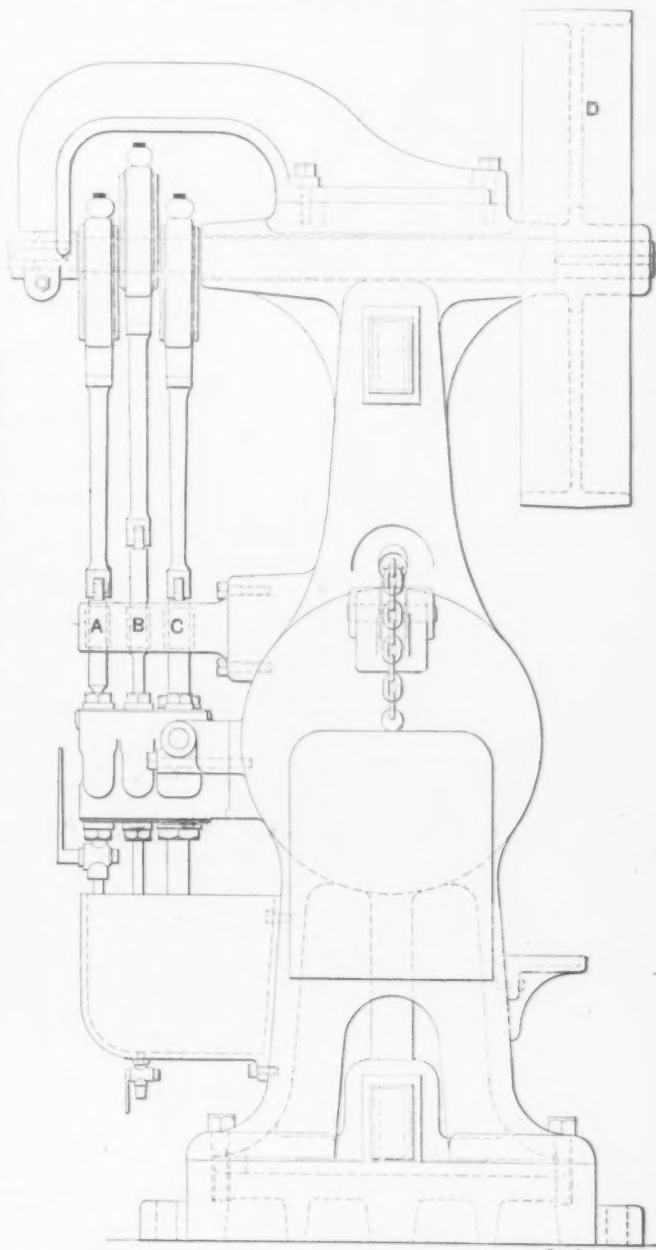


Fig. 3.—End Elevation.

THE PUTNAM 200-TON HYDROSTATIC CAR WHEEL PRESS.

It is remarkable that low freights and the Welsh crisis have brought so comparatively few new orders to Scotland. The fact is that Scotch coal is still the dearest shipping coal in the United Kingdom, and this is unfortunate for our iron and steel producers. The Scotch exports are 1,000,000 tons short of last year, but that extra quantity has not been available for the home trade because the miners have not been making a full output. Like the Welshmen, they are trying to support prices by restricting the output, and, like the Welshmen, they will only succeed in driving business elsewhere. Our coal market, however, will probably keep up until the end of the year, because it will be supported by the demands of the large consumers, who like to lay in a large stock before the "festive season," so as to be able to start right away at the end of the holidays and before the pits are in full working order again. But very early in the new year there will have to be a rearrangement of prices and wages, and both on a lower plane, unless the unforeseen happens.

Low Freights.

The decline in coal exports—it is about 2,200,000 tons for the whole United Kingdom in the 11 months ending November 30—to a large extent accounts for the decline in shipbuilding, or, rather, I should say, suspension of contracts for new ships, because the construction work of shipyards is still active. With 2,250,

000 tons less of heavy cargo to send away there has been, *pro tanto*, less need for ships at our leading ports. Tonnage to that extent has therefore had to seek employment elsewhere, and elsewhere, of course, the tendency of trade has also been to contraction. Thus competition for cargoes brought down freights, and has brought them down so low that steamers have to be run at a loss in several of the leading trades. And even while freights were coming down and the volume of commerce requiring ocean carriage was steadily shrinking, shipbuilders were busily turning out more new ships than ever they had done before. In Scotland, for instance, we have had an output of 500,503 tons in the 11 months ending November—a record output, the nearest approach to which was 461,602 tons in 1900. Curiously enough, the 11 months' output last year was almost the same as the output of the Clyde shipyards alone (461,194 tons) in the 11 months of this year; and this year, by the end of this month, the Clyde output will reach, if it does not exceed, that of all Scotland in the whole

of 1900. But there is not the slightest doubt that too many ships have been built during the last two years, and the shipping world is suffering from an excessive supply. But for the large and exceptional employment of tonnage in connection with the South African war the effect would have been felt long ago and building would have been checked. As it is, ship owners and shipbuilders will first have to "Dree their weird," as the Scotch

iron, there are so few Scotch warrants to operate with or upon. Exports of pig iron are on a decreasing scale. Last month they were only 68,115 tons, as compared with 103,722 tons in November last year. In the 11 months ending November the exports of pigs have totaled only 789,255 tons, as compared with 1,375,108 tons last year. The decrease has occurred chiefly in the shipments to Germany, both direct and via Holland and

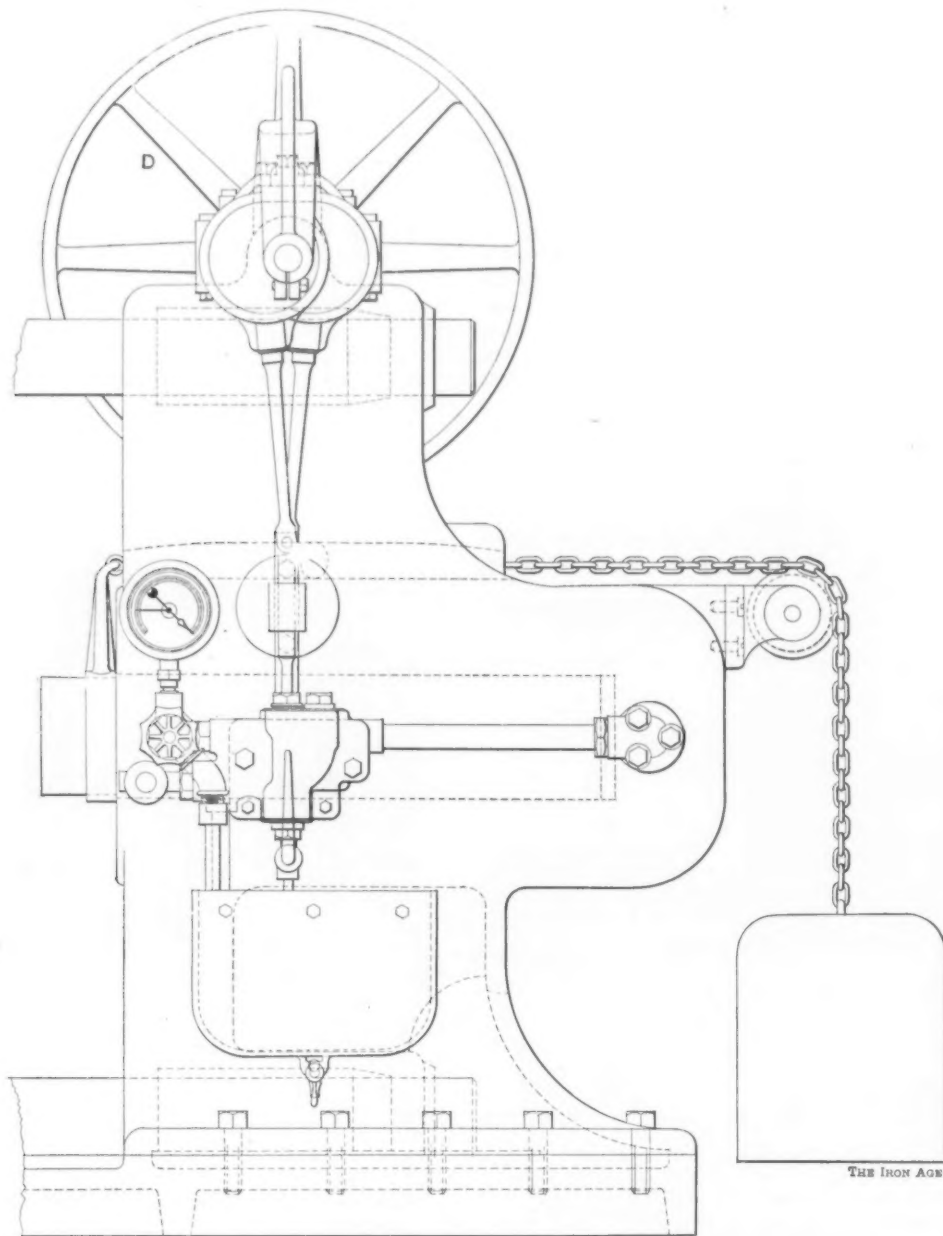


Fig. 4.—Front View of Power End of Machine.

THE PUTNAM 200-TON HYDROSTATIC CAR WHEEL PRESS.

say, until the oversupply becomes reduced by natural (or unnatural) causes and international trade revives again.

The Iron Trade Industries.

The Scotch iron and steel industries are so peculiarly dependent on shipbuilding that they are more affected by the actual and prospective depression in shipping than American readers may quite understand. Shipbuilding is a small thing with you—as yet, at any rate—but it is a big thing with us. Therefore the outlook in the Scotch iron and steel trades is like the state of affairs at Nye's Ford—"far, far from gay." Smelting cannot be a very profitable business just now, if it may be judged by the costs of coal and ironstone and the price of warrants. But so far few of the furnaces are making ordinary iron, and for "brands" and hematite there is a sustained demand at good prices because manufacturers have their contracts to fulfill. Operations in the warrant market are practically confined to Cleveland

Belgium. The figures are striking enough to set forth side by side:

Eleven Months' Shipments of Pig Iron to Germany.

To	1900. Tons.	1901. Tons.
Germany direct.....	453,772	198,080
Germany via Holland.....	317,842	121,981
Germany via Belgium.....	128,303	52,101

The figures relative to Holland and Belgium are subject to reduction in respect to the quantities retained for consumption in these countries, but such quantities are inconsiderable. The shipments to the United States are close up to last year—40,886 tons as against 42,731 tons—but the receipts from the United States in the 11 months have been only 32,277 tons as against 80,129 tons. It is curious how these cross currents of trade vary in volume and intensity. The imports of pigs from "other countries" in the 11 months have been 73,891 tons (as against only 19,368 tons), and of that quantity about 40,000 tons came from Canada; the rest from Ge.

many and Spain. But in the same period we sent 9058 tons over to Canada—one steamer, it is reported, carrying pig iron both ways. The actual imports of Canadian and German ores we shall not know until the statistics of the year are made up, when I propose to return to the subject again. Meanwhile, although we have imported up to this point about 15,000 tons of pig iron more than last year, we have imported 700,000 tons of iron ore less.

The Wages Question.

The wages question is working to the fore in the shipbuilding and iron industries, and it will probably take an acute form early in the new year. For the moment the labor unions seem disposed to watch the course of events among the miners, knowing how much de-

pend on the price of coal. In the shipyards of this district the employers have just been asked for an advance in wages, not that the men could have seriously expected to obtain one when the evidences of decline in the industry are so palpable even to trade union officials, but because they sought to forestall and, if possible, postpone a notice of reduction. However, it is unlikely that the employers will propose any reduction until they

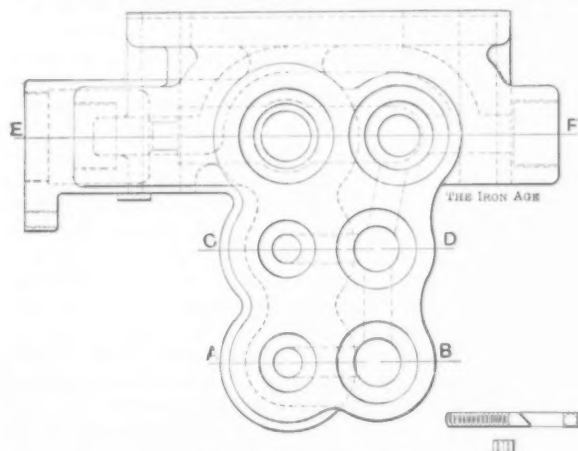


Fig. 5.—Plan of Pumps.

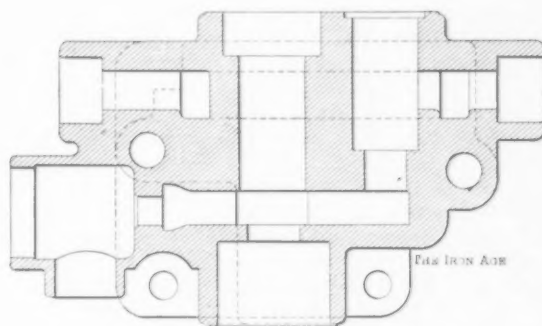
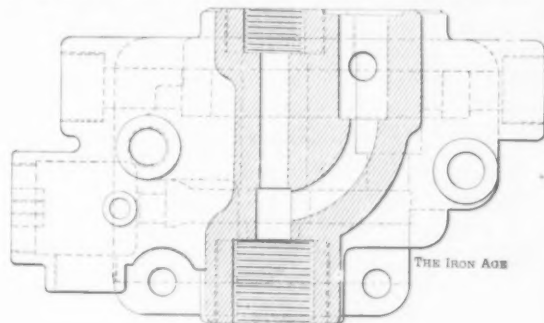


Fig. 6.—Sections A B and E F of Fig. 4.

depends on the price of coal. In the shipyards of this district the employers have just been asked for an advance in wages, not that the men could have seriously expected to obtain one when the evidences of decline in the industry are so palpable even to trade union officials, but because they sought to forestall and, if possible, postpone a notice of reduction. However, it is unlikely that the employers will propose any reduction until they

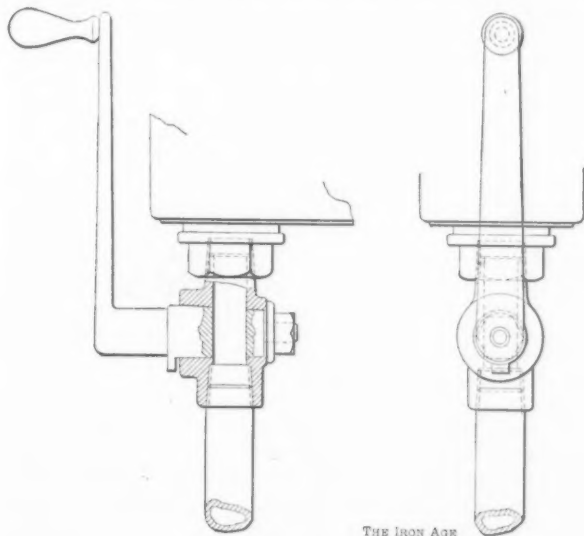


Fig. 7.—Outlet Valve.

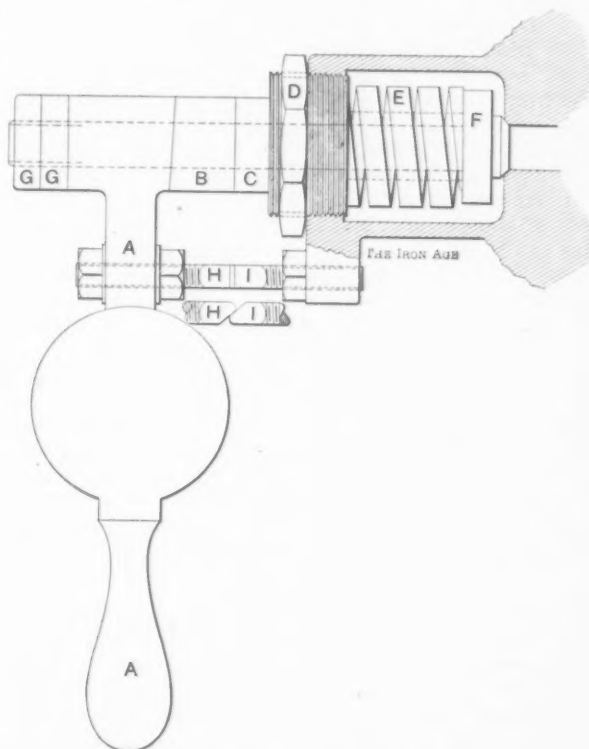


Fig. 8.—Automatic Let Off.

THE PUTNAM 200-TON HYDROSTATIC CAR WHEEL PRESS.

are further through contract work, for there are some big questions to be settled in the shipyards besides wages.

The Federation of Engineering Employers, whose headquarters are in Glasgow though their alliance extends through the whole length and breadth of the Kingdom, have just concluded a working agreement with their employees which is a striking example of how labor relations can be conducted on rational and friendly principles. Three years ago masters and men in the engineering trade were at daggers drawn, and the emissaries and orators of the A. S. E. "raved, recited and maddened through the land" to rouse the whole labor

army in resistance to what was alleged to be an organization to "smash trade unionism." There never was any such intention, but the engineering employers were determined, since they had been compelled to fight, to settle once for all who should be master—the employer or the trade union. They won, and under an agreement concluded in January, 1898, peaceful relations have been since preserved. Experience has shown, however, that this agreement needs revision in the interests of both parties, and this revision has been effected during long, amiable conferences between representatives of the respective executive bodies. In fine, a new working agreement has been drawn up in a spirit which shows that the respective organizations are friendly allies, with confidence in each other, instead of ever suspicious enemies, or, at all events, antagonists. When this arrangement is fully ratified it cannot fail to have a large and wholesome effect upon the whole labor world.

B. J.

The Pittsburgh Iron Trade in 1901.

BY ROBERT A. WALKER, PITTSBURGH, PA.

General Features.

The years 1899, 1900 and 1901 have without doubt been the best three years the iron trade has ever known. There have been short periods of three to six months of phenomenal rises in prices, when concerns who had a large amount of material on hand, realized heavy profits, but as a rule these periods were always followed by a reaction which carried prices lower than ever before. We had such a period in the iron trade in 1895, when prices of pig iron, steel and finished material advanced from \$6 to \$8 a ton, but this was quickly followed by sharp decline which really left the situation worse than before. The iron trade has had, during the three years just closing, a stability in prices it never had before, and the credit for this is partly due to the large consolidations that have been made in the iron trade, notably that of the United States Steel Corporation. A policy of conservatism has been followed, which, in times of exorbitant demand and scarcity of material, such as we had this summer during the strike, kept prices on a reasonable basis, and prevented those wide fluctuations in values which are always dangerous and do much to unsettle confidence. Of the past three years in the iron trade the present one has eclipsed the other two, both as regards tonnage and profits made. In fact, the earnings of concerns in the iron and steel, machinery and allied trades in the past three years have been enormous, but have undoubtedly been heaviest this year. The United States Steel Corporation have earned, since their organization, an average of about \$10,000,000 a month, and if present conditions can be maintained the officials of this great corporation believe that these earnings can continue for a long time to come. In the case of independent manufacturers the ratio of earnings has been fully as large as those of constituent companies of the steel corporation, and we have personal knowledge of some concerns who will take out profits this year equal to or exceeding actual investment in plant. In the case of outside sheet mills particularly the earnings this year have been enormous and account for the fact of so many new concerns going into the sheet business. There was an enormous demand for material all through this year which the furnaces and mills were unable to meet promptly, and as a result have been from two to three months behind on contracts nearly all through the year. Taken all in all, 1901 has been a record breaker in the iron trade in every way.

Consolidations.

In the years 1899 and 1900 some very large consolidations were made in the iron trade, among these being the American Sheet Steel Company, the Crucible Steel Company, the American Tin Plate Company and others, all of which is history now. It remained, however, for 1901 to eclipse in the matter of consolidation anything previously done in the formation of the United States Steel Corporation, with a capital stock of a little more than \$1,100,000,000, and with a capacity of fully 60 per cent. of all the iron and steel made in the United States. The trade are very familiar by this time with the causes which led up to the organization of the United States Steel Corporation. Chief among these was the fact that the Carnegie Steel Company were getting ready to go into other lines of manufacture. This meant serious competition for other consolidated interests and would have undoubtedly imperiled their earning power to very great extent. The Carnegie Steel Company were so large, and had such powerful financial resources, that even the building of a seaboard line with its enormous cost was being considered and would probably have

been built had not the steel corporation been organized. The plans of the Carnegie Steel Company not only threatened bitter competition for others in the steel business, but to the Pennsylvania and other railroad interests, and for the purpose of eliminating this threatened competition, railroad, banking and steel interests came together in February this year in New York, and after weeks were spent in arranging plans, finances and other details, the United States Steel Corporation were organized in an almost incredibly short space of time, when the magnitude of the project and the resources necessary to put it through are considered. It is not probable that any other than the J. P. Morgan interests could have successfully launched this mammoth combination in such a short time, and with so little effect on the financial situation, as it had when carried through. It is claimed that not over \$25,000,000 in actual cash was used to complete this deal, the basis being, exchange of securities of the United States Steel Corporation for those of constituent interests. The magnitude of this organization and the difficulties which had to be surmounted before it could be put through are hardly conceivable. In the first place, Andrew Carnegie, who had built up the greatest steel concern in the world, had to be offered sufficient inducements to have him retire from the steel business, and this in itself was probably the greatest task the promoters of the new organization had before them. It is a matter of history how Mr. Carnegie had given an option on his majority holdings in the Carnegie interests a few years before, for which he received as a consideration \$1,170,000, and how those having the deal in charge, although backed by powerful financial interests, failed to put it through. Mr. Carnegie announced at this time that the next person who wanted an option on his Carnegie holdings would have to pay more for it, and he kept his word. When negotiations were being carried on with Mr. Carnegie, by the promoters of the steel corporation, it looked several times as though they would fall through, obstacle after obstacle coming up. These were overcome, some with a good deal of difficulty, and finally the announcement came that the J. P. Morgan & Co. interests had secured control of the entire holdings of Andrew Carnegie and his 34 or more partners in the Carnegie Company. It was arranged that Mr. Carnegie and his partners should be given bonds bearing 5 per cent. annual interest for their holdings, the various Carnegie works and other properties as well being security for the payment of the interest on these bonds. Mr. Carnegie's holdings being arranged for, the rest was comparatively easy, and the acquisition of the Rockefeller ore properties and steamship lines, the Federal Steel Company, the American Steel & Wire Company, the American Bridge Company and the Big Four, or the Moore properties, these being the National Steel Company, American Sheet Steel Company, American Tin Plate Company and American Steel Hoop Company, were quickly made, and the most stupendous consolidation the business world had ever known was completed.

The organization of the steel corporation has a widespread effect and will undoubtedly have greater influence in the trade as time goes on. It can be stated on authority that it will never be the policy of the steel corporation to advance prices simply because they have the power to do so, but, on the contrary, it will be the aim of the corporation to act conservatively in the matter of prices as well as on all other questions. This policy has already given and will continue to give a stability to the iron trade that it never had before, and which is certain to have a very beneficial effect. The

officials of the corporation desire to avoid and will use their utmost endeavors to prevent the wide fluctuations in prices of iron and steel products that have marked the trade in the past, and which have been attended with no little harm. In less than their one year of existence the corporation have given numerous proofs of this desire to act conservatively in the matter of values. In the summer months, with a strike on hand, an exorbitant demand for nearly all kinds of material and with a very limited supply, the corporation, through their constituent companies, steadily refused to advance prices, but, on the contrary, readjustments were made in several instances where it was found that prices on several kinds of material were higher than they ought to have been in comparison with other lines. A notable instance is that of sheets, the corporation, through the American Sheet Steel Company, having made a cut of \$5 a ton on the lighter gauges of sheets, and just at a time when much of their capacity was idle, the demand was heavy and the tendency of prices decidedly upward. In other lines, too, proof has been given during the year of this policy strictly adhered to—not to advance prices unless conditions demand it. There is no doubt whatever but that the six beam mills composing the Beam Association could just as easily have secured in the last six or eight months of this year 2 cents a pound for beams instead of 1.60 cents, which has been the ruling price. Several of the members of the association insisted upon an advance, but the corporation, which have more than 50 per cent. of the allotment, argued that to put up prices might curtail demand, and, further, that on the basis of 1.60 cents the mills could make a good profit and were assured plenty of business. It is possible, too, that the price of rails might have been advanced to \$30 a ton had the corporation not opposed it. It is this policy of conservatism, not only as regards prices, but in other matters as well, that is bound to make friends for the corporation, even among those who at first were strong in their denunciation of the corporation and termed it a "trust." This is clearly a misnomer and is applied to the corporation only by those who do not understand the nature of the organization and the terms under which they were formed. It is proper to refer here to the fact that at the head of the steel corporation, and largely guiding their destinies, is a man who only a few years ago was a minor employee of the Carnegie Steel Company, but who has risen rapidly from the ranks and whose keen business sagacity is the wonder and admiration of his legion of friends. The name of Charles M. Schwab is known the world over in the steel trade, and the decisive manner in which he handled the strike in the summer and signally defeated the Amalgamated Association is a proof of his keen judgment and foresight. Mr. Schwab and his assistants, from their long connection with labor, knew perfectly well that if they would allow the Amalgamated Association to dictate the labor policy to the steel corporation there would be no end to trouble.

Another important consolidation in the iron trade in 1901, if it may be called so, is that of the acquiring of control in the Pennsylvania and Cambria steel companies by the Pennsylvania Railroad Company. There is no doubt but what this step was taken by the Pennsylvania Railroad to protect its own interests, as it is such a large user of iron and steel and owned for many years a large interest in the Pennsylvania Steel Company. A comparatively recent transaction of importance was the acquiring, by Charles M. Schwab and his associates, of the Bethlehem Steel Company, at South Bethlehem, Pa., the works consisting of armor plate and forging departments. The transaction is made much more important by the fact that the Carnegie and Bethlehem companies control entirely the armor plate trade.

One failure in the matter of consolidation was scored this year, being that of the attempt to consolidate the interests of Tidewater Steel Company, Lukens Iron & Steel Company, Central Iron & Steel Company and Worth Brothers. At one stage of the negotiations it seemed certain that this undertaking would go through, but at the last moment the head of one of the interests

refused to bind himself not to re-engage in the plate business and the negotiations fell through.

It is not unlikely that the early part of 1902 will witness one or more important consolidations in the iron trade. Report has it that negotiations are on for a consolidation of interests of Sharon Steel Company and Youngstown Iron, Sheet & Tube Company. Nothing official has yet been given out, but it is understood some preliminary work is being done looking to the merger of these two concerns. During the year there have been two or three attempts made to consolidate some of the leading iron and steel interests, a recent one being that in which negotiations were carried on by a firm of New York attorneys. It is hardly thought, however, that anything will come of them. It will be extremely difficult in the future to float the securities of such consolidations on the market, as the public is already carrying a heavy load of these stocks, and, in addition, a great majority of the best works have already been absorbed by one concern or another. There are some notable exceptions to this, however, one of these being Jones & Laughlins, Limited, of the American Iron & Steel Works, in this city. This concern are the largest outside of the constituent companies of the steel corporation, and while their name has been frequently mentioned as being connected with proposed consolidations, we can state officially that there never was any ground for these reports. Jones & Laughlins, Limited, will likely continue in the iron and steel business for many years in their present capacity.

Foreign Trade.

It will not be necessary in this report to give very much space to the subject of foreign trade, because the business in such products as pig iron, rails, billets, sheet and tin bars has almost entirely ceased and practically nothing has been done in the last six months or more of this year. On the contrary the situation has been reversed to some extent, and in the last two months we have imported quite a tonnage of billets and sheet bars, and negotiations are on for further business. There are two reasons for this changed condition in this foreign trade and which easily explain the situation. One is that our rail and steel mills have been so congested with tonnage nearly all of this year that it was simply out of the question to ship any product to the other side. Our blast furnaces have had such a heavy demand for metal that foreign trade was not needed and our exports of pig during this year were confined to some lots sold early in the year by Southern furnaces. A second reason for the stoppage in our foreign trade is that the steel trade in England and on the Continent is so bad and prices are so low that it is practically impossible for us to meet them. This is really about the only disquieting feature in the situation, because should domestic consumption fall off our steel manufacturers would find it very difficult and perhaps impossible to compete for foreign trade. We may note, however, that there has been a good business this year in the lighter forms of finished iron and steel and also in engines, electrical machinery, iron working tools and other equipment. A notable example is that of the equipment for the large new shops of the British Westinghouse Electric Company, at Birmingham, England, which will be completed in the first half of 1902. Hundreds of thousands of dollars' worth of electrical machinery, engines and other equipment have been sent from this country to the other side for these works. Much of the electrical equipment for the London underground railway is being made in Pittsburgh by the Westinghouse Company. Within the last two or three months American capital has been considering the feasibility of erecting large and modern office structures in some of the principal cities of the old world, such as Paris, London and elsewhere. Before much can be done in this direction, however, it will be necessary to modify some of the laws on the statute books in England, which limit the height of buildings to five or six stories. However, once a start can be made in this direction, it will mean an enormous consumption of structural material which may be furnished by American mills. As long as present conditions last it will not be necessary for our large steel interests to seek foreign

trade, but when the time comes that we need it, it is probable that the ingenuity of the American manufacturer will devise ways by which he can meet conditions on the other side, should they continue to remain as they are.

New Construction.

The year 1901 has been a record breaker in the matter of the erection of new blast furnaces, steel works and finishing mills for the manufacture of all kinds of finished iron and steel. So much new construction has been undertaken that engineering concerns, engine builders and in fact all kinds of construction plants are filled up with work for the next six months or more, and in the case of some of the large engine builders, like the Allis-Chalmers Company and the Southwark Foundry & Machine Company, enough orders are on the books to take all the engines the concerns can turn out for the next year or more. The prime cause of so much new construction was first the organization of the constituent companies of the United States Steel Corporation and later the organization of that corporation. These consolidations made available a great many men who are well up in the manufacture of finished products in iron and steel. At the same time prices have been at a point that make the manufacturing business very profitable and an inviting field for capital.

The Pittsburgh district has, as usual, easily led in the number of new plants already erected and now under construction. The Carnegie Steel Company have spent millions of dollars in the past year in the building of new blast furnaces, steel works and finishing mills. The most important blast furnace construction done by this firm this year was the building of two entirely new Carrie stacks at Rankin, which are claimed to be the finest blast furnaces in point of equipment in the world. The stacks are designed for a daily output of 600 tons each, but one stack has already made the remarkable output of 790 tons in 24 hours. The Carnegie Steel Company have also rebuilt Nos. 1 and 2 Carrie stacks and have brought the capacity of these furnaces up to 400 tons a day each, or more. The four stacks should make from 2600 to 2200 tons a day, and the latter figure is more likely to be exceeded. All this metal is taken by hot metal bridge over Monongahela River to the Homestead Steel Works, for use in the open hearth and Bessemer works. At the Duquesne Steel Works a new open hearth plant has been built containing 12 50-ton furnaces and which has already made some remarkable records in output of open hearth steel. Two new merchant bar mills have already been completed at Duquesne Works, which will turn out about 1000 tons a day of merchant steel bars. A small billet mill has been under construction for some months at the Duquesne Works and is about ready to run. This mill will roll billets down to 1½ inches from the ingot at the initial heat. At the Homestead Steel Works of the Carnegie Company the capacity of nearly all the finishing mills has been increased during the year by the installation of new equipment, it being the policy of the Carnegie Company to have their plants modern and up to date, regardless of expense. Within a month the Carnegie Company have had plans drawn for a new angle mill, to be built at Homestead. Some enormous records for output have been made at the Homestead Works recently, production in October having reached high water mark and exceeding by thousands of tons the best previous record for any one month. At the Edgar Thomson plant some new machinery has been installed during the year, and this works, under the efficient management of Thomas Morrison, turned out in 1901 about 650,000 tons of finished rails. It is the intention of the Carnegie Company to remodel and enlarge the nine Edgar Thomson furnaces at Bessemer. One stack has already been rebuilt and others will follow as fast as possible. The enormous records for steel production made by the Carnegie Company this year have been the wonder of the steel trade in the whole world. In October Edgar Thomson, Duquesne and Homestead turned out 343,971 tons of ingots, or at the rate of more than 4,000,000 tons a year.

Jones & Laughlins, Limited, of the American Iron & Steel Works, have spent enormous sums of money this

year in the building of new plants and the betterments of old ones. This concern finished during 1901 the last of the four new Eliza furnaces, giving them a complement of four stacks at this plant, with a daily capacity of 600 tons a day, or more, for each furnace. At their American Iron and Steel Works this firm started in the summer of this year the building of a new Talbot continuous open hearth furnace, which is expected to make 800 tons of steel a day, and also the building of a 42-inch blooming mill. When these have been finished Jones & Laughlin will be able to turn out about 4000 tons of steel a day, all of which they expect to use in their own finishing mill. Jones & Laughlins make a greater variety of product than any other steel concern in the country, rolling down to 3-16 rounds and up to 24-inch beams. Their new beam mill, to roll 24-inch, was finished during the summer, as was also their rod mill, which has a capacity of about 300 tons a day. When their new blooming mill has been finished Jones & Laughlins will be in position to roll rails, sheet and tin bars, if they desire.

The Crucible Steel Company of America, through subsidiary companies, the St. Clair Furnace Company and the St. Clair Steel Company, started work in the summer at Clairton, on the Monongahela River, about 30 miles from Pittsburgh, on the building of three blast furnaces, to have a daily capacity of about 600 tons each, and also an open hearth steel plant, to contain 12 50-ton furnaces. The St. Clair Steel Company hope to make steel early in the summer of 1902, while the St. Clair Furnace Company will have one of their blast furnaces ready for operation in the fall of 1902. It is expected that the entire output of the steel plant will be used in the various finishing mills of the Crucible Steel Company.

During 1901 the Union Steel Company completed at Donora, Pa., their rod, wire and wire nail mills, and this concern are now large factors in these trades. Their mills are modern, no expense having been spared to procure the very best construction and equipment possible, and some notable records have already been made in their mills in output of rods and wire product. The Union Steel Company intend to make themselves entirely independent of the open steel market, and have had plans drawn for the building of a large blast furnace to make 500 tons a day or more, and also of an open hearth steel plant, to furnish steel for their finishing mills. The concern have secured the services of Nevin McConnell, who will superintend the erection of the open hearth steel plant.

The Pittsburgh Steel Company, organized in this city during the summer by Wallace H. Rowe, formerly Pittsburgh manager for American Steel & Wire Company, John Bindley, Edwin Bindley, W. C. Reitz and others, have started work at Monessen, Pa., on the building of rod, wire and finishing mills, which will have a very large capacity. The firm will also build a steel plant, a blast furnace, and expect to make their rods and wire products from the ore up.

The Sharon Steel Company finished during the summer their large works at South Sharon, Pa., embracing a blast furnace, open hearth steel plant of eight 50-ton furnaces, rod, wire and nail mills. This concern have one of the most complete plants in the country for making rods and wire, and will very materially enlarge it during 1902. Recently the directors of the company decided to build two more 350-ton blast furnaces and four more open hearth steel furnaces, making 12 in all, thus giving the concern a daily output of steel of about 1200 tons. It is also the intention to materially increase the capacity of the rod and wire mills. The Sharon Steel Company are also building very complete skelp and tube mills at South Sharon, which will be ready for operation in 1902, and will be able to turn out tubes up to 12-inch and larger. A 12-mill sheet plant is also under erection by this firm, and will be ready to run within 60 days. The Sharon Tin Plate Company, an affiliated interest of the Sharon Steel Company, completed during 1901 the building of a 10-mill tin plate plant, the entire output of which is taken under contract by the American Tin Plate Company. Ten more mills are under construction, some

of which have been finished and started, and the whole 20 mills will be running early in 1902. The entire supply of tin bars for the plant is furnished by the Sharon Steel Company. The works of these two concerns were fully illustrated and described in *The Iron Age* of July 4, 1901. During 1901 the works of the Sharon Steel Hoop Company was started up in the manufacture of hoops, bands and cotton ties, and have been in successful operation right along. The concern obtain the greater part of their supply of steel from the Sharon Steel Company under contract.

In the New Castle district there has not been much new construction this year, but the National Steel Company have decided to very materially enlarge the capacity of their Shenango plant at that place. The two present 6-ton vessels will be torn out and larger ones installed in their place. The capacity of the finishing mills will also be increased. The Pennsylvania Engineering Works and the Vulcan Foundry & Machine Company, both at New Castle, have made material enlargements to their plants, and both concerns have been crowded with orders for rolling mill equipment all through the year. The New Castle Forge & Bolt Company, just organized at New Castle, are now building a plant to make nuts, bolts and rivets.

In the Youngstown, Ohio, district there has been a great deal of new construction during the year and much more is under way. The Youngstown Iron, Sheet & Tube Company have nearly completed the building of large sheet and tube mills, and have just increased their capital stock from \$2,000,000 to \$4,000,000. Part of this additional money has been used to buy Alice Furnace, at Sharpsville, Pa., from Pickands, Mather & Co., and it is the intention of the company to build a new blast furnace on their property in Youngstown, work to commence in the early spring. An open hearth steel plant will also be built, and the concern have acquired ore properties, and have made contracts for ore to give them a sufficient supply to run both their furnaces for many years to come. The plants of this concern will be strictly modern throughout, all the equipment being the very best that money could buy. The concern will be large factors in the sheet and tube trades after their mills are started.

The Youngstown Iron & Steel Roofing Company, who have been in the roofing business in Youngstown for some years, finished and put in operation in September a very complete four-mill sheet plant. The concern have their own puddling mill, squeezers and bar mill, and intend to make iron sheets almost exclusively.

The Republic Iron & Steel Company completed early in 1901 a Bessemer steel plant at Youngstown, which has a daily capacity of about 500 tons. A small billet mill is being hooked onto the 4-inch mill, and the concern will roll down to 1½-inch. Most of the product of the Bessemer plant is used in the finishing mills of the Republic Iron & Steel Company in the Youngstown district, but some of it is sold in the open market. The Niles Iron & Sheet Company finished at Niles, Ohio, a very complete sheet mill plant, and have been making black and galvanized sheets for the open market for several months.

In the Wheeling district some important new construction has been finished during the year, and much more is under way. The National Tube Company have under erection a new 600-ton blast furnace, which will be completed about the spring of 1902, and have also made material improvements at the Riverside Works in Wheeling. The National Steel Company have finished the building of two blast furnaces and the rebuilding and enlarging of their Bessemer steel works, and this is now one of the best plants owned by that interest. It is said the cost of conversion at the Mingo Junction works is as low as or lower than at any of the other works of the National Steel Company.

The Wheeling Steel & Iron Company are building a very complete pipe mill, to make up to 16-inch. This concern are large makers of skelp, but there being periods when it was somewhat difficult to find a market for their skelp, they decided to put in a tube mill and finish most of their skelp into pipe.

At Martin's Ferry, Ohio, the Laughlin Nail Company

finished and put in operation in October a very complete four-mill sheet plant, which was described in *The Iron Age* of December 12. The plant will be increased to six mills, and nearly the entire output will be marketed in the form of roofing, siding and ceiling. Also at Martin's Ferry the American Tin Plate Company have increased the Laughlin works to 23 tin mills, making it the second largest tin plate plant owned by that interest. At Bridgeport, Ohio, the sheet mills of the American Sheet Steel Company have been materially enlarged by the addition of more mills. In the Pittsburgh district there were also built some very complete sheet mill plants, which have been put in operation. Among these is that of the Allegheny Steel & Iron Company, with sheet mill at Tarentum, Pa., containing 50-ton open hearth furnace, bar mill of special design, six hot mills and three cold mills. The concern are making about 60 tons of sheets a day, and will enlarge their plant in 1902 by the building of another open hearth steel furnace, and probably more finishing mills. The Parkersburg Iron & Steel Company of this city have finished a new sheet mill at Parkersburg, W. Va., which was started up about December 15. It contain six hot mills, and the firm will add a forge and bar mill. The Pope Tin Plate Company of this city have started to work at Steubenville, Ohio, on the building of a 12-mill tin plate plant, which, however, will not be completed before the fall of 1902, if then. The La Belle Iron Works moved their office from Wheeling, W. Va., to Steubenville, Ohio, in 1901, and are building at the latter place very complete skelp and tube mills, blooming mill and open hearth steel plant. This tube mill will make all sizes of pipe from ¼-inch up to 8-inch, and is expected to take the entire output of the skelp mill. The Eastern Tube Company of this city finished during the summer of 1901 new tube mills at Zanesville, Ohio, which are now in successful operation. There have been numerous other smaller sheet, tube and tin mills built in the Pittsburgh district during the year, while others are in various stages of erection. Among these may be mentioned the Stark Rolling Mill Company, who are building an open hearth furnace, bar mill and six-mill sheet plant, at Canton, Ohio; the Tuscora Steel Company, who have nearly finished a new sheet mill at Newcomerstown, Ohio; the Carnegie Sheet Iron Company, who are building a new two-mill sheet plant at Carnegie, near this city; the Curtis Sheet Steel & Corrugating Company, who have recently finished a sheet mill plant at Newcomerstown, Ohio; the W. H. Griffiths Company, who are building new tin mills at Washington, Pa., and Follansbee Brothers Company, who will build a four or six mill sheet plant in the Pittsburgh district, work on which has not yet started. In addition to these we may note the new crucible steel plant, to be built by the Colonial Steel Company, at South Monaca, near Pittsburgh, which will make crucible steel and other fine steels. At the head of this company is James W. Brown, formerly of Howe, Brown & Co., Limited, but later of Crucible Steel Company. We note also the crucible steel plant now being built by the Kidd Brothers & Burgher Steel Company, at Aliquippa, Pa., and also the large crucible plant being built by the Jessop Steel Company, at Washington, Pa.

At Johnstown, Pa., the Cambria Steel Company, through their identified interest, the Conemaugh Steel Company, have finished a very complete open hearth plant, blooming and finishing mills, and which are in operation. This concern have plans for very material enlargements, some of which are now under way. Taken all in all, the year 1901 has been a record breaker in the matter of new construction, but it is just possible the year 1902 may eclipse it, as so much work will be carried over into next year from this year, and plans are also under way for the building of many more new plants. The United States Steel Corporation, through their constituent companies, will spend vast sums of money in 1902 in the betterment of existing works, and possibly in the building of some new plants.

Labor Troubles.

The year 1901 was marked by a serious, but ill advised strike, in the sheet and tin plate trades, and which

also involved several plants of the National Steel Company and the Federal Steel Company. The strike was started on account of the refusal of the United States Steel Corporation to sign for all the nonunion, as well as the union mills of the American Sheet Steel Company. The steel corporation had no desire to engage in a strike, and, in order to avoid it, offered to sign the scale for three or four nonunion mills, among these Wellsville and McKeesport works, but the Amalgamated Association stubbornly insisted that the scale be signed for all mills, union or nonunion. The corporation refused, and the result was a strike in the sheet mills, but which involved only the union mills. Later the men employed in the mills of the American Tin Plate Company went out on a sympathetic strike, and this was followed by the stoppage of the men in the Shenango and Bellaire works of the National Steel Company, and in two mills of the Federal Steel Company. The steel corporation offered every opportunity to the Amalgamated Association for a settlement of the trouble, but without avail, and finally the constituent interests set to work to start their idle mills. This move was very successful, and as fast as a mill was started it was placed on the nonunion list. The strike ended in September in complete defeat and almost disruption of the Amalgamated Association. Other than the above, the year was free from labor troubles, men in all crafts being steadily employed and at the highest rate of wage ever known. In fact, there was a serious scarcity of labor in some months of the year and operations at some plants were seriously retarded on this account. Blast furnace labor, coke workers, common and skilled labor, were never as well employed, and there seems to be no valid excuse for any man's being idle. Labor has participated largely in the general prosperity of the country which has ruled in the past three years. The outlook for 1902 is that labor will be well employed and at high wages, and the new year ought to be on this account comparatively free of labor disturbances.

Price Agreements.

There were in force in the iron trade during 1901 price agreements on three very important commodities—rails, plates and structural material. These worked very well during the year and were renewed in December for 1902. The billet pool seems to have been lost sight of in the last few months, but the necessity of any agreement to maintain prices on steel has been removed by the extraordinary demand of the last six months and its scarcity. There has also been a price agreement on steel and iron bars, the latter having more recently gone into effect, and which have worked fairly satisfactorily, only occasional cutting in established prices being reported. As long as business in the iron trade is good and values are high price agreements work well, but when demand is dull and prices low verbal agreements are subjected to a test which they very often fail to stand.

The Outlook for 1902.

The outlook for 1902 could hardly be better, and unless all signs fail the first six months of the new year at least will be as prosperous as could be desired. An enormous tonnage of pig iron has been sold for the first half, the steel mills are well employed on contracts running into next year, while the finishing mills will enter 1902 with enough tonnage on their books for the next three months, and on some lines of material for a longer period. Boom prices in 1902 are not expected, nor are they desired. It will be the constant endeavor of the steel corporation and other large steel interests as well to keep prices on all kinds of iron and steel on a conservative basis and prevent as far as possible any wide fluctuations in values. This statement is already borne out by the fact that the steel corporation have fixed the price of ore for next year on the same basis as for this year.

Pig Iron.

The year 1901 in the pig iron trade, both in the matter of tonnage and profits, was better than its predecessor, and in point of profits was probably as good as 1899, the banner year. It is true prices of pig iron were not nearly so high at any time in 1901 as in 1899 and

1900, but the market was more stable and the furnaceman was able to make a good profit on his iron all through the year. The demand was good right along and the furnaces were able to sell their iron, with the exception of a short period in the summer, about as fast as they made it. On January 1, 1901, there were in blast in the United States 233 blast furnaces, with a weekly capacity of 250,351 gross tons, against 280 furnaces on January 1, 1900, with a weekly capacity of 294,186 tons. The total output of pig iron in the United States in 1900 was 13,789,242 gross tons, but this large output will be exceeded by 1901, as the output this year is expected to be above 15,000,000 tons. The Pittsburgh district is now making from 30 to 35 per cent. of the total output of pig iron in the United States, certainly a remarkable record. The Carnegie Steel Company alone, at their 19 blast furnaces, make about 20 per cent. of the total production. Jones & Laughlins, Limited, are also heavy producers, and the St. Clair Furnace Company, when their three new blast furnaces are finished, will make from 40,000 to 45,000 tons a month. The indications are that the manufacture of pig iron will be centered more and more in the Pittsburgh district, on account of its facilities for cheap production.

Bessemer.—At the beginning of 1901 the Bessemer pig iron market was quiet and the price was \$13 to \$13.25, Pittsburgh. The market was without change until about January 20, when the Carnegie Steel Company came into the market and bought 100,000 tons from the Bessemer Furnace Association at \$12.50, at furnace, or \$13.25, Pittsburgh. Other large steel interests bought at this time and in one week there were sales of close to 200,000 tons of iron, prices ranging all the way during the month from \$12 to \$12.50 at furnace, most of the iron being sold at \$12.50. On February 1 the freight rate on pig iron from the Valleys to Pittsburgh was reduced from 90 to 75 cents a ton. About this time there was a slight labor disturbance, the furnace operators having asked blast furnace labor to accept a reduction of about 15 per cent. The furnaceman argued that he was paying the same rate of wage on \$12.50 iron as when it was \$24 a ton. For a time it looked as though a strike would result, but the matter was compromised by the men accepting a cut of about 5 per cent. Prices of Bessemer iron continue to rule at \$12.50 to \$13 at furnace, until about February 15, when a material advance took place, carrying the price up to \$13.50 to \$14 at furnace. In the latter part of February Carnegie Steel Company, Jones & Laughlins, National Tube Company and other large consumers bought heavily, the output of the furnaces being pretty well taken care of up to July 1. It is probable that in January and February the Bessemer Furnace Association and other furnaces in the Central West sold close to 500,000 tons of iron. March opened with the price of Bessemer iron \$14.50 to \$15 at furnace. Iron for March and April was very scarce, and for prompt delivery it was bringing from \$15.75 to \$16 at furnace. At this time negotiations were under way for a consolidation of some of the merchant furnaces in the two valleys and in the Pittsburgh district, but after some weeks of uncertainty nothing came of it. On Tuesday, April 3, the Bessemer Ore Association met in Cleveland and fixed the price of Bessemer ores at \$4.25, delivered lower lake ports, a reduction of \$1.25 a ton over previous prices. Production of pig iron at this was showing a heavy increase and was at the rate of 15,000,000 tons a year.

The month of May was very quiet in the iron trade, Bessemer being held at about \$15.50 at furnace. June opened with the market weak, and about the 15th of that month the Steel Corporation bought about 15,000 tons, at \$15.25 at furnace. By July 15 the strike was on and the pig iron market was practically lifeless. In the last week in July the Steel Corporation bought about 50,000 tons of Bessemer and basic and the market improved somewhat. August was an extremely dull month in the iron trade and prices went off very materially, some Bessemer iron being sold as low as \$14.50 at furnace. Some of the large steel plants were closed in August and September and a good deal of iron was being piled. The strike was declared off about September 15, and this was followed by the Steel Corporation buying

some 50,000 tons of Bessemer and basic iron at \$15.25 for the Bessemer and \$14.25 for the basic and for prompt delivery. The pig iron market did not show much change in prices or in general condition during the last three months of 1901. The Steel Corporation and other large consumers were heavy purchasers in the market right along and the output of furnaces was sold as fast as made. The price of Bessemer iron remained at \$15.25 at furnace during October, November and December, but in the latter part of December pig iron became exceedingly scarce and the price of Bessemer advanced to \$15.75 and \$16 at furnace. The supply of cars was very inadequate, furnaces could not get coke to run on, and the output of iron was being heavily reduced. In the latter part of December some heavy sales were made for first quarter and first half of 1902, at \$15.50 to \$15.75 at furnace, a good deal of iron being sold at the latter price.

The Steel Corporation and the Bessemer Furnace Association are working very closely together, and the output of the furnaces will probably continue to be taken by the constituent companies of the Steel Corporation for some time to come. It is not probable that there will be any decline in prices of Bessemer iron during first half of 1902, but on the contrary the price may materially advance before long because consumption seems to be larger than output, and until the car situation improves and the furnaces can get coke enough to run the output will be much below what it should be, with practically all the furnaces running. It looks at this writing as though a number of furnaces in the valleys and in the Pittsburgh district as well would have to shut down.

Gray Forge.—The market on gray forge iron in 1901 followed Bessemer very closely, both as regards demand and prices. January opened with standard brands of gray forge iron selling at about \$13 to \$13.25, Pittsburgh. There was little change during the whole month of January, the demand being moderate and prices changing but little. By February 15 prices of gray forge had gone down and it sold at \$12.75 to \$13, Pittsburgh. However, there were heavy sales at this time and the market commenced to advance and at the close of February forge was held at \$14 to \$14.25, Pittsburgh. These prices ruled all through March and there was a good demand in the whole month. April opened with forge selling at \$14.50 to \$14.75, Pittsburgh, and these prices ruled all through May. Early in June, in sympathy with Bessemer, price of forge declined to some extent and it sold at \$14 to \$14.25, Pittsburgh. The course of the market was steadily downward in June and July, and in the latter month demand was dull, because so many rolling mills were closed by the strike. In August and early in September the forge market was practically lifeless, and it sold as low as \$12.50, at furnace, or \$13.25, Pittsburgh. With the settlement of the strike in September came a better demand for forge and prices also improved, the market selling up to \$13.75 to \$14 at this time. As in Bessemer, the market on gray forge steadily improved in the last three months of 1901, and prices also advanced materially. In November and early in December the American Steel Hoop Company bought heavily, and in the last two weeks of the year standard brands of gray forge sold at \$15.25 to \$15.50, Pittsburgh. The furnaces in the Valleys and also in the Pittsburgh district that run on forge are pretty well sold up for the first two or three months, and the year closed with the forge market very strong. Quite a considerable tonnage of Southern forge was sold in the Valleys and also in Pittsburgh at different times during 1901, and at prices ranging from 50 to 75 cents a ton lower than far standard Northern brands.

Foundry.—There were no important developments in the foundry iron market during the year until November and December were reached, when the market was characterized by heavy purchases of foundry iron by large consumers in the Pittsburgh district and elsewhere, deliveries in some cases running through all of 1902. The year opened with No. 2 foundry selling at \$14 to \$14.25, and No. 1, \$14.50 to \$14.75, Pittsburgh. There was a good demand all through the year, and in November and December prices advanced materially, owing to heavy demand, the year closing with No. 2 iron

being held at about \$16, and No. 1 \$16.50, delivered in the Pittsburgh district. Sales of special brands of foundry were made in December at even slightly higher prices.

Steel Billets.

The important event in the steel trade in 1901 was the building of so many new open hearth plants and the planning of others, work on which will start very early in 1902. It is very evident that there will be few if any extensions to Bessemer capacity in the future, but in basic open hearth it would seem that the time is rapidly coming when the small consumers of steel will have their own open hearth plant in preference to buying steel in the open market. The necessity for this course was shown in the latter part of 1901, when the price of billets for prompt delivery was so high that it practically prohibited small concerns from buying steel to roll into rods, steel skelp, bars and other finished material, prices on which were almost on a par with steel. The organization first of the constituent interests of the United States Steel Corporation, and then of that interest, has completely revolutionized the steel business, and there are really very few large buyers of steel in the open market in comparison with the number there were before these consolidations were made. The National Steel Company, who are the largest individual producers of billets, sheet and tin bars, give practically the entire output to the Steel Hoop, Tin Plate and Sheet Steel companies. Other large interests, like Jones & Laughlins, the American Steel & Wire Company, the Federal Steel Company, the Sharon Steel Company, use practically all the steel they make.

A feature of the steel market in the past year was the fact that a number of large consumers who still buy in the open market made contracts with leading interest to be supplied with steel on a sliding scale basis, the price of Bessemer pig iron being computed monthly, and so much per ton for conversion being charged over this price. Taking Bessemer pig iron at \$16 to \$16.99, Pittsburgh, the charge for conversion on these sliding scale contracts is \$6.50 a ton.

When the year 1901 opened the pool price of \$19.75, delivered, Pittsburgh, Wheeling or the Valleys, on billets was in force, extras being charged for high carbons and for basic billets. This price and the extras continued in force in January and February, but at the close of the latter month steel was scarce and was bringing for prompt delivery \$2 to \$3 a ton over the pool price. By March 15 the billet situation was such that the minimum price of Bessemer billets, 4 x 4 inch, was \$24, Pittsburgh. This price continued to rule through April, sales being made at that figure for May and June delivery. The formation of the United States Steel Corporation put a new complexion on the steel market, and while the pool agreement was still in force, its existence was only nominal. Billets in June for prompt delivery brought from 50 cents to \$1 a ton over the pool price, but the demand was only for small lots. The steel market during July and August was extremely dull, and in the latter part of July prices declined to about \$22.50, maker's mill. However, the strike in the finishing mills at this time involved two or three important mills of the National Steel Company, with the result that billets became scarce and prices advanced very materially. In the first week in September steel was bringing \$24.50 to \$25, and before the month closed the supply of steel was so short that it was bringing from \$26 to \$27 for prompt delivery. The situation as regards supply became worse and in the latter part of October, and also in November, billets for prompt shipment sold at \$27.50 to \$28, maker's mill. Steel was so hard to get and prices so high that consumers had been looking up the matter of importing from the other side, with the result that in November several lots of billets and sheet bars were brought over here from Germany and delivered at buyers' works at prices lower than for domestic steel. The situation did not show much change in December, billets continuing scarce and bringing very high prices right up to the close of the year. However, as noted above, large consumers have sliding scale contracts, and demand for

the last three or four months of the year was mostly for small lots. The number of buyers of steel in the open market will steadily decrease in the future, as quite a number of consumers, both large and small, will have their own open hearth steel plants before 1902 has passed into history.

Steel Rails.

The output of steel rails in 1900 was 2,385,682 tons, the rail mills being crowded with work and pushed to utmost capacity during the whole year. That was a banner year, but 1901 has surpassed it. The exact figures are not known, but the output of our rail mills this year will approximate 2,600,000 tons, and there will be carried over into next year 300,000 to 400,000 tons. Some enormous records for output were made in the various rail mills during the year, the Edgar Thomson mill making in one month over 62,000 tons of finished rails. At the beginning of 1901 the price of rails was \$26 at mill, and this price continued in force until April 10, when the rail pool met and advanced prices \$2 a ton, or to \$28 at mill, for standard sections, effective May 1. The market did not show any change during the balance of the year, the price continuing at \$28 at mill. Along in September and October the railroads came into the market and placed heavy contracts for rails for 1902 delivery, and when the year closed the mills had booked about 1,500,000 tons of new orders, aside from tonnage carried over from this year. The indications are that the rail business for 1902 will amount to about 2,600,000 tons all told. The tonnage is not expected to be quite as heavy as in 1901. It is probable that the Lackawanna Iron & Steel Company will be out of the market much of 1902, as they are removing their plant from Scranton to Buffalo. The Tennessee Coal & Iron Company will soon be ready to make rails, but most of their tonnage will be taken by the Louisville & Nashville, the road being a large owner in the works, and other Southern roads. It is possible, too, that Jones & Laughlins may roll some rails before 1902 is ended.

Finished Material.

Plates.—In point of tonnage the year 1901 in plates was not as satisfactory to the mills as its two predecessors. The first half of the year in this respect was much better than the second half. The demand in the last six months was unusually light and at one time threatened to disrupt the association, some of the Eastern mills having become very much dissatisfied with the small tonnage they were receiving under their allotment. This dissatisfaction resulted in an effort being made to consolidate four of the leading Eastern mills, these being Tidewater, Lukens, Worth Brothers and Central Iron & Steel Company. It was believed that by combining the Eastern mills into one concern and putting a strong man like A. F. Huston at the head of it the plate situation would be considerably simplified. However, it is history now how the deal failed to go through, the principal reason being that the heads of one of the concerns refused to sign an agreement not to re-engage in the plate business. The failure to consolidate these four mills imperiled the existence of the plate agreement for a time, but after a protracted meeting of the mills it was renewed for another year with some modifications. The mills remaining outside pledged themselves to maintain the price. During the year 1901 the price of plates was advanced twice, \$2 a ton each time. The year opened with the base price of tank plate $\frac{1}{4}$ -inch and heavier at 1.40 cents, Pittsburgh, the association having a schedule of delivered prices, which in some cases are slightly less than the base price of 1.40 cents, Pittsburgh, plus the actual freight. This is explained by the fact that to some points of delivery the mills absorb part of the freight. Early in March demand had improved so that the price was advanced to 1.50 cents for tank, but before March had expired demand was so heavy that some mills were getting an advance of \$2 to \$3 a ton over the fixed price. This condition resulted in another advance of \$2 a ton being made in the first week of April, bringing the base price of tank plate up to 1.60 cents, Pittsburgh, with the usual differentials for the other grades, at which rate it remained for the balance of the year.

In the summer and fall demand for plates fell off to considerable extent, and at times some of the smaller mills were very short of specifications. However, demand improved somewhat in December and the outlook for 1902 is regarded as very encouraging, from the fact that thousands of cars have been ordered from the steel car companies, the locomotive shops were full of work and large contracts were being placed for lake boats. All this means that a tremendous tonnage of plates will be needed and the mills are expected to have plenty of work for the first half of the year at least.

Structural Material.—The year 1901 was a record breaker in the structural steel trade, tonnage being much heavier than in any one year before, and it is believed will aggregate 600,000 tons or more. In December the beam pool was renewed for another year by the six mills composing it—namely: Phoenix Iron Company, Pencoyd Iron Works, Jones & Laughlins, Limited; Carnegie Steel Company, Cambria Steel Company and Pottsville Rolling Mill Company, which will make the sixth year of its existence. Some enormous records for output of shapes were made in the different mills in 1901, and in the early part of the year Jones & Laughlins finished and started up their 24-inch beam mill. The Carnegie Steel Company also made material improvements to existing works and drew plans in the latter part of the year for the building of a new angle mill at Homestead, to have a capacity of 1000 tons a month. Some enormous contracts for structural material were placed during the year and the mills were crowded to their utmost capacity throughout the entire year. Building operations in Pittsburgh surpassed all previous records, notable structures started during the year being the Frick Building, claimed to be the finest office building in the world; People's Bank Building, Arrot Building, Keystone Bank Building, House Building, Fort Wayne Railroad Bridge and other large structures. The outlook for building operations next year is excellent and indications are that the mills will be crowded with work all through the year. The year 1901 opened with the price of beams and channels up to 15-inch at 1.50 cents, with the usual differentials for other shapes. No change was made in prices until the latter part of March, when on account of heavy demand and the advancing market on raw material, prices of beams and channels were advanced \$2 a ton, with the exception of angles, which were put up \$4 a ton. These advances made uniform prices on all shapes, except tees, which take an advance of \$1 over other shapes. These prices continued in force until the close of the year and are not likely to be changed for some time.

Sheets.—The sheet trade in 1901, both as regards tonnage and profits, was a record breaker, and exceeded any previous year in these respects. In the summer occurred the labor strike, which for a time closed some of the union mills of the American Sheet Steel Company, but that concern were not seriously inconvenienced for the reason that more than 60 per cent. of their output is made in nonunion mills in the Vandergrift district. Desperate efforts were made during the strike by leaders of the Amalgamated Association to get the men in some of the nonunion mills of the American Sheet Steel Company to go out on strike, but these were entirely unsuccessful, and, on the contrary, several of the union mills were made nonunion and will remain so. During the strike sheets became somewhat scarce, and for about three months mills that could make prompt delivery were able to get almost any prices they asked. Small lots of No. 27 black sold up to 3.75 cents for prompt shipment and galvanized at 65 per cent. off. The year 1901 opened with No. 27 black at 2.85 cents, at mill, and galvanized at 70, 10 and 5 off. These prices continued in force until March, when the market advanced to 3 cents for 27 and galvanized to 70 and 5 off. In March and April the demand was extraordinary, and in the first part of April No. 27 black was selling at 3.25 cents, at mills. Prices continued on this basis through April and May, but in June the demand was not quite so urgent and prices eased off slightly. However, in the latter part of June the demand improved and prices became quite firm. On July 1 came the labor trouble in the sheet mills, and the unexpected announcement by the American Sheet Steel

Company of a reduction of \$5 a ton. This put the minimum price of No. 27 in large lots to jobbers at 2.90 cents and No. 28 3 cents. The minimum price of galvanized was reduced from 70 and 10 to 70, 10 and 5 off. These prices continued in force by the leading sheet interest during the rest of the year, but the outside mills were able to sell at much higher prices, especially in the third quarter of the year, when sheets were very scarce and commanded almost any price for prompt shipment. A feature of the sheet trade in 1901 was the large number of new mills built, and others started under construction. It looks as though the sheet trade may be overdone, but up to this time there has been demand enough to take the output of all the mills about as fast as made.

Iron and Steel Bars.—At the opening of the year the price of steel bars was 1.25 cents, at maker's mill, and iron bars were about \$1 higher. Tonnage was moderate, and the mills were fairly well filled up. In February demand fell off some, but prices remained firm, and in the latter part of the month steel bars were scarce, and were bringing 1.35 to 1.40 cents, at mill. The situation in March was very strong, and at the opening of April the price was 1.50 cents, at mill. Higher figures were being paid for prompt delivery. About April 20 an association of steel bar makers was formed, which included constituent companies of United States Steel Corporation, Republic Iron & Steel Company, Jones & Laughlins and Cambria Steel Company. The minimum price of soft Bessemer steel bars was fixed at 1.40 cents, Pittsburgh, with \$2 per ton advance for open hearth stock and certain extras on higher carbons. The agreement also covered small angles, channels and other shapes, and a schedule of delivered prices was adopted. Heavy contracts were placed at this time by agricultural implement makers and other large buyers, and the bar trade was in very satisfactory condition. At the close of June the demand was not so urgent, and some of the bar mills were badly in need of tonnage, and were quoting minimum prices or lower for small lots. However, with the opening of July came the strike and the shutdown of the bar mills of the American Steel Hoop Company. This caused a firmer feeling in the market, and in August bars had become so scarce that \$2 to \$3 a ton advance over the regular price was being paid. About September 20, owing to scarcity of steel and crowded condition of the mills, the official price of steel bars was advanced \$2 a ton, or to 1.50 cents, Pittsburgh, for Bessemer stock, with the usual extras for high carbons and shapes. This price was maintained for the balance of the year; the tonnage being large enough to keep the mills well filled up. The course of the iron bar market was largely the same as in steel bars, the agreement among the iron bars mills fixing the price at 1.50 cents, Pittsburgh, for Western shipment, and \$1 advance for Eastern shipment. These prices were in force at the close of the year.

Skelp.—The year 1901 in the skelp trade has been a fairly prosperous one, demand being good all through the year, with the exception of the closing two months, when it fell off very much, and prices declined to some extent. The year opened with grooved iron skelp selling at 1.50 cents, steel about 1.35 cents and about \$1 a ton advance for sheared skelp. In the summer months, and particularly during the strike, prices advanced very fast, iron skelp selling in August as high as 1.90 cents for grooved and 2 cents for sheared, prices on steel being correspondingly high. In September skelp could hardly be had for prompt shipment, and it brought very high prices, iron skelp selling as high as 2.05 cents, maker's mill. However, after the strike the supply became more plentiful and prices gradually declined, the year closing with iron skelp selling at 1.75 cents, and steel at about the same price, or perhaps slightly higher.

Tubular Goods.—The year 1901 was exceedingly satisfactory to the tube mills, demand being heavy all through the year, and prices very profitable. The earnings of the National Tube Company are said to have averaged slightly more than \$1,000,000 a month during the entire year. The outside tube mills also made large profits, especially during the strike, when some of the leading mills of the National Tube Company were closed, and tubing was so scarce that it brought almost any price asked for prompt delivery. Some of the smaller tube mills ad-

vanced prices very fast during the strike, one new price-list that came out showing an average advance of about 30 per cent. over its predecessor. The National Tube Company, however, pursued a conservative course and refused to advance prices, although importuned to do so by some of the smaller mills. Toward the close of the year the demand for merchant pipe and oil country goods fell off to some extent, as it always does in the winter months, and prices became slightly easier. Some new capacity also came on the market in the latter part of the year, and 1902 will witness the starting up of a number of large new tube mills, among these being Sharon Steel Company, La Belle Iron Works and Wheeling Steel & Iron Company. Some smaller tube mills are also being built, and it is beginning to look as though the tube business may be overdone before long.

Connellsville Coke.—The coke trade in 1901 was a record breaker in every way, output being much heavier, and profits larger than in any previous year in the history of the trade. The average weekly output of coke in the Connellsville region during 1901 was about 200,000 tons, and in some weeks was from 235,000 to 240,000 tons. The total output for the year in the Connellsville region will approximate 11,000,000 tons, and it may slightly exceed that figure. Prices during the year have been high, and in the closing three months, owing to car shortage, furnace operators would have paid any price to get prompt coke. During the summer the coke interests of constituent companies of United States Steel Corporation were taken over by the H. C. Frick Coke Company, the officials of that concern being elected to similar positions in the concerns absorbed. An important deal in the coke trade during the latter part of 1901 was the purchase by United States Steel Corporation interests of a large number of developed coal and coke properties in the Pocahontas region, and the subsequent sale of these at a handsome profit to the Norfolk & Western Railroad. It is understood that these same interests have recently acquired a very large acreage of undeveloped coal property in the Pocahontas region, and will develop this property, building about 1000 ovens a year for the next three years, the output of coke to go to an identified Western steel interest. The outlook for the coke trade for 1902 is excellent, a large number of contracts for both furnace and foundry having been made for delivery in the first half of the year and at very good prices.

Nails and Wire.—The first half of 1901 in the wire and nail trade was much better than the second half, for the reason that in the last three or four months of the year a number of new wire nail concerns started, and there was an overproduction of both nails and wire, which caused a serious decline in prices. The year 1901 opened with the price of wire nails \$2.20 to jobbers; barb wire, \$2.80, and plain wire, \$2.25. There was a splendid volume of business in the first seven or eight months of the year, and the leading wire interest were able to sell their entire product about as fast as made. However, a lot of new competitors came on the market, demand fell off in the closing months of the year and prices declined as a natural result. The year closed with wire nails selling at about \$2 a keg to jobbers, while established prices of plain and barb wire were being cut anywhere from \$2 to \$4 a ton. There is no doubt but that the nail and wire capacity of the country is much larger at the present time than consumption, and for this reason the probable course of the market for 1902 is somewhat uncertain. The cut nail market was quite satisfactory during the year, demand being fairly large all through the year, while prices were kept on a profitable basis. The cut nail mills have an agreement among themselves, and prices have, in the main, been fairly well maintained by the mills that are parties to the agreement.

Deeds have been filed at Welland, Ont., transferring about 300 acres of land along the Upper Niagara River adjoining Queen Victoria Free Park and the Dufferin Islands district to the Canadian Niagara Power Company. This property was formerly owned by the Sutherland Macklem Estate. The land is to be used among other purposes for factory sites and possibly as a site for an industrial village in connection with the develop-

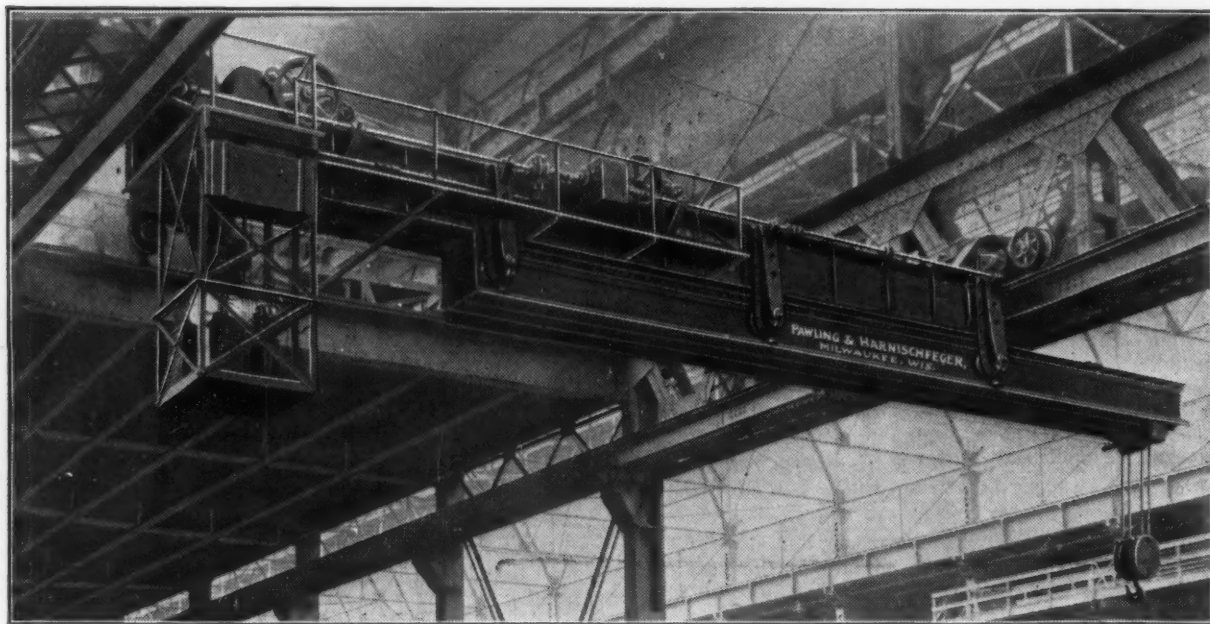
ment of the Canadian Niagara Power Company. The Canadian Niagara Power Company have received bids for the construction of their new wheel pit on the Canadian side, but as yet the contract has not been awarded. However, it is expected to be awarded within a very few days.

The Pawling & Harnischfeger Double Extension Electric Traveling Crane.

Recent shipyard development in the United States is identical with other manufacturing industries, in that space is utilized to the highest degree and all such forms of power are used as will secure the largest results in the least time at minimum expense. From the nature of the work to be accomplished in building ships the highest utility is demanded, and doubtless this arises in part from the necessity of handling the heaviest material. A ship is cumbersome, it cannot be moved about to be fitted out, hence special devices are employed to convey the required material to the ship. The best engineering talent has been devoted to effect this result. The machine shop methods are equally important in working on shipbuilding material and need fully as

lary bridge can project into the right and left bays of this building by passing beneath the crane runways. Within the operating length of this auxiliary bridge in the bays, 16 feet 4½ inches, any material up to 7½ tons can be picked up, transferred to the opposite bay and then across the building, or brought into the main part and transported the length of the building. The head room to take care of this crane, as a unit in its main travel was but 24 inches and the end trucks were made to operate in this space, doing so with entire satisfaction.

The bridge travel is 600 feet, which can be covered in one and one-half minutes with full load, the travel being effected by a 7½ horse-power Pawling & Harnischfeger motor. At any point along this travel the crane can stop and extend the auxiliary bridge into either bay, of course avoiding the supporting columns, which are spaced 18 feet apart. Safety of operation is secured by interlocking the main and auxiliary bridges when at center, and when so interlocked current is only given to the controller handling the main drive, and when not interlocked the main drive cannot start. It also is impossible to extend the auxiliary crane until the crane as a unit has come to rest. In both cases no current passes and the electric brakes hold the main and auxiliary



THE PAWLING & HARNISCHFEGER DOUBLE EXTENSION ELECTRIC TRAVELING CRANE.

progressive arrangements, by reason of the large units under consideration and the pressure to turn out work rapidly.

The New York Shipbuilding Company, Camden, N. J., recognized the necessity of special appliances to meet their individual shop needs, and lately ordered from Pawling & Harnischfeger, Milwaukee, Wis., a type of electric traveling crane which was made with features that proved to be unique and are worthy of close investigation.

This crane is the subject of the accompanying illustration. It will be noted that it has the double extension feature, made possible by an auxiliary bridge, in one way made a part of the entire crane and yet distinct in its own travel. This auxiliary bridge has a lateral travel of 8 feet 4 inches to the right and 8 feet ½ inch to the left beyond the drive wheels of the main bridge. These travels give an additional crane service of 16 feet 4½ inches in excess of the span of the main bridge, which is 38 feet 4 inches, resulting in a total range of 54 feet 8½ inches.

Through the use of the double extension type the New York Shipbuilding Company gain service both for the transverse and rectilinear dimensions of their shops, a factor of highest importance in the rapid handling of material. The crane under consideration is installed in the west wing of the main machine shop, and the auxil-

bridges stationary. Another feature of safety is afforded in the double safeguard to prevent extending the auxiliary bridge too far, which would result in breaking the rack teeth and gearing. This is partly accomplished by adequate interlocking stops on the main and auxiliary bridges, which work in connection with friction disks on the motor shaft actuating the gearing of the auxiliary bridge. These disks are set to transfer power only up to the limit of moving the auxiliary bridge with full hook load, and the instant the stops come in contact the disks revolve one upon the other, effectually preventing any disaster. Tilting of the auxiliary bridge when at full load extension is prevented by the upper guard rails, which engage with the truck wheels supporting the auxiliary bridge. The auxiliary bridge weighs 12,000 pounds and is suspended from the main bridge by six brackets fitted with turned steel wheels, which engage with the upper and outer flanges of the auxiliary bridge. The lateral movements of this bridge are secured through a toothed rack placed on top of the bridge and with which engages a cut gear wheel operated through three reductions by a 7½ horse-power Pawling & Harnischfeger motor. This motor is placed in the center of the main bridge and fitted with an electric brake. The motor transmits a speed of 50 feet per minute to the auxiliary bridge under full load.

From the half-tone it will be noted that the bottom

block and rope are at the extreme right, and this rope runs on sheaves fastened to a special traveling trolley which runs the entire length of the auxiliary bridge in three-quarters of a minute, and is capable of being instantly stopped at any point of its travel. The auxiliary bridge and trolley can be operated simultaneously, giving a resultant speed of 100 feet per minute. Upon the trolley of the auxiliary bridge are sheaves which carry the wire rope which receives power from the 30 horse-power motor placed upon the main bridge at the extreme left. This motor will lift the full load at the rate of 30 feet or light load at 60 feet per minute. Two wire ropes extend from the drum of this hoist to the center of the main bridge and there pass over independent sheaves, thence go to the extreme left of the auxiliary bridge, pass around sheaves and are led to sheaves upon the auxiliary bridge trolley and then lead to the bottom block.

Returning from the block the ropes pass over two more sheaves on the trolley, then to sheaves at the extreme right of the auxiliary bridge, thence to two more independent sheaves at the center of the main bridge, finally passing around an equalizer. This peculiar form of reaving permits hoisting of the load with or without travel of the auxiliary trolley, precisely as the operator may determine. Further than that, the auxiliary bridge trolley can travel to any point with full load and not affect the height of the load from the ground, as the ropes simply run over the pulleys and sheaves. The 30 horse-power motor is equipped with both electric and load brakes, making it possible to instantly and absolutely hold the load at any point or to lower at any desired speed.

The cage for the operator contains four Pawling & Harnischfeger controllers to take care of the four motors, which in this instance operate on 220 volts. The switches, fuses and all necessary electrical apparatus are located where most convenient to the operator. A platform extends from cage to all working parts.

While the crane was built for a maximum load of $7\frac{1}{2}$ tons, yet it was given a test load of 11 tons. The bottom block and hook have a safety factor of six; the structural steel work is designed not to have a greater stress under maximum load than 10,000 pounds per square inch for tension, 6000 pounds per square inch in shear, and the bearing on diameter of rivet and pin holes does not exceed 12,000 pounds per square inch.

In addition to the direct stress, the lateral stress, due to sudden starting and stopping of the crane when fully loaded, does not exceed 10,000 pounds per square inch gross section. The material for the bridge is of open hearth steel, having an ultimate strength of 65,000 pounds per square inch. The weight of entire crane is 51,000 pounds.

Dr. Bang's Electric Lamp.

An English paper reports that Dr. Bang, a Danish physician, has constructed a new electric lamp, which is likely to prove of great importance even outside the field for which he has intended it. In the ordinary arc lamp the carbons are heated to some 3000 degrees, but Dr. Bang has succeeded in avoiding this high temperature by making the carbons hollow and letting a strong current of water run through them. The effect is very singular. Almost the whole of the energy of the electric current is removed to the light arc between the two electrodes, while the latter themselves remain so cool that one can touch them with one's finger while the lamp is burning. In addition to this the carbons are consumed so slowly that the usual automatic adjustment can be dispensed with. In science the new lamp will no doubt be invaluable: its cold light is able to kill bacteria in one-eighteenth of the time required with the light of the ordinary arc lamp. The electrodes can be made from different substances, according to the use for which the lamp is intended. For medicinal purposes, carbon, silver, and certain kinds of iron appear preferable. Metallic electrodes have been used for several years by doctors, but they have had many drawbacks; they gave a great heat, the metal melted, &c., and it was necessary to place the patient at a comparatively great distance

from the lamp. All these objections have been overcome—or rather, entirely removed—in Dr. Bang's lamp, which is very small and handy, and in which consumption of electricity is exceedingly small.

Central American Notes.

SAN JUAN, NICARAGUA, December 15, 1901.—Salvador's financial condition is continually bettering; the coffee crop this season will be nearly 500,000 bags. The question over the dredging work at the Port of Triunfo, Salvador, in which a contracting firm of San Francisco, Cal., are interested, will be submitted to arbitration; the sum in dispute is about \$500,000. Minister Zaldívar, the representative of Salvador at Washington, is doing much toward increasing commercial relations between both countries.

The Nicaragua Government has just paid the monthly subvention to the Chilean Steamship Line; this amounts to \$2250.

The British Consul-General is here examining into the causes of the decrease in British trade in Central America, and the equal increase of American business.

The merchants of San José are trying to obtain a general reduction of freight rates on the Costa Rica railway. This is the line which runs from the port of Limón to the capital, San José, and is owned by a British corporation. The Western Line, or Pacific Railroad of Costa Rica, is being pushed steadily toward the coast; a number of American contractors are now in charge.

The British Legation has signed a new trade-mark treaty with the Government of Costa Rica. This is a matter of great interest to our exporters and manufacturers; there is no way at present to protect American trade-marks in most of these countries. Why should not our United States Consul and Ministers be requested to move in this matter?

The large bridge over the Chamelion River in Honduras has just been completed at a cost of \$250,000. The San Lorenzo road, one of the finest in Central America, is being steadily pushed ahead by President Siérra. It is of such importance to the country that Honduras will be practically isolated till it is finished. General Siérra was educated in the United States, and they say that it was there where he got a clear idea of the value of good roads.

The price of the great staple of this country—coffee—is steadily improving, and there are good reasons to hope for renewed prosperity in Central America. C.

The Niagara Falls Power Company have authorized the completion of the installation in power house and wheel pit No. 2. This station and pit will have an output capacity of 55,000 horse-power. Some little time ago contracts were awarded for six generators and the same number of turbines, each of 5000 horse-power capacity. Now that the completion of the installation has been authorized five additional turbines and generators will be installed. This authorization is looked upon at Niagara Falls to mean that additional new manufacturing plants are in sight, and that they will be ready for operation by the time the pit and station installations can be put in readiness to serve them with current.

The Syracuse Smelting Works have engaged the three-story building at 94 Gold street, New York City. They are now fitting it up, and are removing their office from Syracuse to the new location. With the New York warehouse, a factory at Syracuse and one at Montreal, Canada, with Brown & McLain of 41 Federal street, Boston, Mass., as their agents, they will be able to make shipments more promptly than ever before. While the manager, L. Sapery, was abroad during the summer he made arrangements with the well established firm of Henry Bath & Sons of London, Liverpool and Swansea to act as their European agents.

"Commercial Reciprocity" is the title of a pamphlet compiled by the Committee on National Legislation of the National Association of Agricultural Implement and Vehicle Manufacturers. Copies may be obtained by addressing Frank E. Lukens, secretary, Monadnock Block, Chicago.

Finishing a Connecting Rod Brass Without Special Gang Cutters.

The process of finishing a locomotive connecting rod brass without the use of special gang cutters is an interesting one. It is done with a vertical miller, built by the Becker-Brainard Milling Machine Company of Jamaica Plain, Mass. In the first operation, Fig. 1, an inserted tooth face mill is used upon a gang of five half brasses. The feed is at the rate of 7 inches per minute

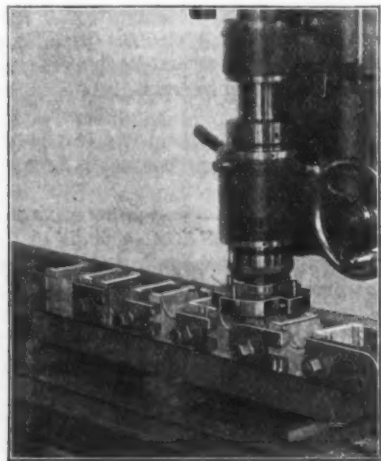


Fig. 1.

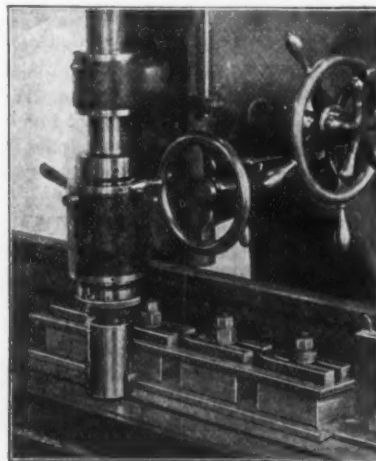


Fig. 2.

and an exact surface is insured, as is always the result when a mill of this pattern is employed. The work is so clamped that changes can be made readily to facilitate the finishing of the other surfaces.

The second operation consists in finishing the sides of the lower flanges. An inserted tooth cutter is used and a table feed of $3\frac{1}{2}$ inches per minute is maintained. The upper flanges are similarly finished at the same setting, but changing the cutter.

In finishing the sides of the brasses, Fig. 3, the same

tional Bank of Utica, and Joseph Rudd. A plot of 8 acres has been secured in East Utica, situated on Turner street, adjoining the Erie Canal, and convenient to the Broad street railroad switch.

Designs for the buildings of the new plant are now being drawn by the superintendent of the Hart & Crouse Company. All of the buildings will be of brick construction, the largest being the foundry. There will also be a large machine shop and warehouse. It is expected that the plant will be completed and in full opera-

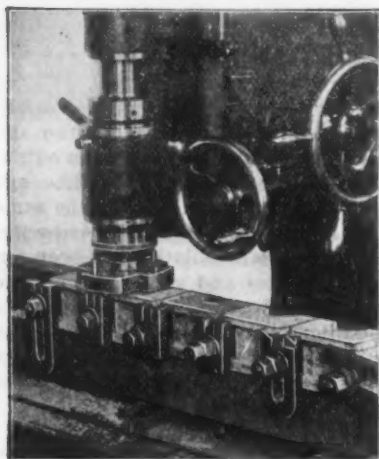


Fig. 3.

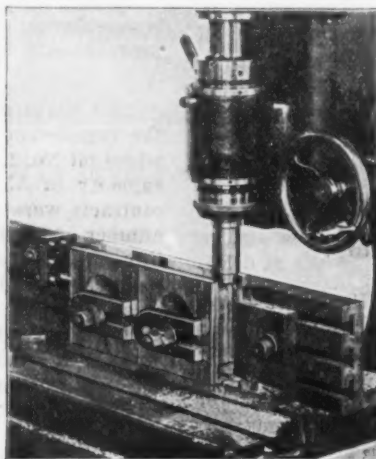


Fig. 4.

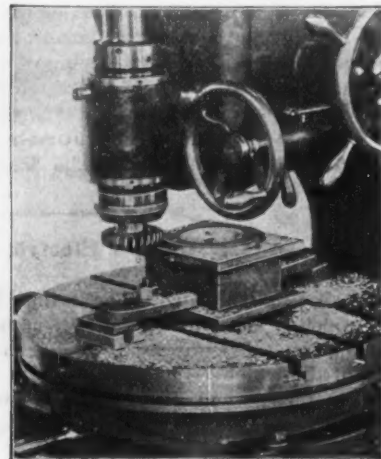


Fig. 5.

FINISHING A CONNECTING ROD BRASS WITHOUT SPECIAL GANG CUTTERS.

mill is employed as in the first case, but it is fed at a somewhat slower rate. The position of the pieces is then reversed and the other sides completed with the same cutter.

The bottom of the recess, Fig. 4, is finished in two cuts per side, each at the rate of 14 inches per minute. The tops of the flanges are cut separately at the same rate.

Surfacing the side of a box and finishing the fillet at the same operation by means of a round nosed mill is illustrated in Fig. 5. For this purpose the rotary table is employed.

tion early in July. The machinery for the equipment of the plant will be of the most approved modern type for turning out a large amount of work, accurately finished. Designs for a very handsome and complete line of steam and hot water radiators have already been selected, and the patterns are in course of completion.

The company will have the advantage of experienced management, having a thorough acquaintance with the trade. The same men will be at its head that have made a success of the Hart & Crouse Company, who have established a large trade for the Royal line of steam and hot water heaters and hot air furnaces. Their customers

should insure the sale of a large proportion of the output of the new plant. It is expected that the plant will have a capacity to enable the company to put upon the market a larger number of square feet of radiation than was ever put on the market by any new concern in its first year of business.

Trade Unions and the Birmingham Brass Trade.

The London *Times* is publishing a series of articles on the attitude of the English trades unions and their influence on different industries. These are being republished in the New York *Times*. The second of the series deals with the brass trade of Birmingham, in which there have been the following developments:

Complaint is often made against trade unions that they are too disposed to look solely at the individual interests of the worker, without regard to the conditions of the economic situation, and especially of such factors therein as foreign competition and the results that competition must have upon the prices of the goods on which the worker is engaged. Recent experiences in those brass trades which form one of the staple industries in the Birmingham district would suggest that the allegation in question is not made without good cause. Among the numerous manufacturers themselves there is a normal degree of competition quite keen enough in its way; but they have common enemies in American, and more especially in German, rivals. This foreign competition might, certainly, become much more severe than it is, and it might even be extremely serious, if the foreign maker were to exactly copy the contour or pattern of English made brass goods manufactured for the English home trade. Happily a considerable proportion of the foreign supplies bear indications of their foreign origin, and are easily recognized as German or American; and in the brass trades, at least, it is found that English people, with their conservative English instincts, are still sufficiently patriotic to pay even a little more for an English made article, provided the difference in price is not too great.

Thus far, at least, there is a redeeming feature in the situation. But, though the foreign competition may not yet be extremely serious, it is undoubtedly severe, and the manufacturer to-day must be content with a very small profit on individual articles, depending for his gain on the possibility of turning out very large quantities. In the trade in electrical accessories, for instance, prices are cut so fine that there is hardly any profit at all. The development of the electric light has attained to so much greater proportions in Germany than in Great Britain that the makers of accessories in the former country have a distinct advantage over those in the latter. The German manufacturer will buy English china, mount his own brass work thereon, and send the complete article here, beating the English maker in his own market. A leading manufacturer says that when he has told his men of such things as this and shown them the foreign made articles the men have simply given him an incredulous smile, without in any way realizing the gravity of the position. Then there is the case of the electric light lamp holder, which is to the electric light what the burner is to the gas bracket. At one time the manufacture was protected in this country by a patent, and the holder sold for 1 shilling 8 pence. But the patent was not in force in Germany, and as soon as it expired here the German makers so flooded the English markets with their holders that the price was at once reduced from 1 shilling 8 pence to 4 pence.

These are just a few illustrations of what foreign competition has done in the brass trades; yet, in face of such facts, the National Society of the Amalgamated Brass Workers delivered at the heads of the employers a bombshell in the shape of a series of demands which, in the opinion of the employers themselves, could not have been conceded without endangering the very existence of the industry. Not only was a minimum wage demanded for adults, but the society asked that it should be fixed at what the employers regarded as an "enormously" high figure—namely, 6 pence per hour, plus 20 per cent., representing a minimum wage of 35 shillings

per week for every worker over 21. The employers represented that, while some men of 21 might be worth £4 a week, there were others who were worth little or nothing, and that to give a minimum wage of the proportions demanded would so send up the cost of production as to deprive them of any hope they might retain of being able to meet the foreigner at all. There were various other things asked for as well, such as a limitation of the hours to 54 per week (this the employers were willing to grant), and the imposing of hard and fast restrictions as to the number of under hands and also of boys to be employed in each factory. Seeing the trade, as they thought, threatened with ruin, the employers raised a fund among themselves and took various steps in defense of their position. There was already a masters' association for each branch of the trade, representatives of the different branches forming a joint committee.

Eventually it was agreed to refer the whole matter to arbitration, and Sir David Dale of Darlington was appointed by the Board of Trade for that purpose. The employers put before the arbitrator a mass of facts bearing on the harm that must result from the fixing of so high a minimum wage and the limiting of juvenile and under hand labor, pointing out that in many cases the Germans and Americans were importing brass goods at a cheaper rate than they could be made for in Birmingham. If, it was added, any award were fixed under which the selling price of the English made goods would have to be increased, the English trade would be not only crippled, but absolutely wiped out. On the other hand, the case for the men, as presented through their union officials, showed a disposition to ignore the subject of foreign competition, and set out the interests of the men alone. In the result the arbitrator's award, given at the end of 1900, was against the men on practically every point but the limitation of hours to 54. A minimum wage was fixed, but it was put at 4½ pence per hour, plus 20 per cent., instead of at the higher rate which had been demanded; while the arbitrator refused to interfere with the proportions of juvenile labor and of under hands. The award was duly accepted by each side, and, in view of the employers, the Birmingham brass trades were, for the time being at least, saved from the annihilation with which they were threatened.

New Railroad Building in 1901.

According to the best sources of information obtainable, including reports of the State Railroad Commissions, so far as they are yet completed, replies received from the railroads direct, and an estimate based on their previous reports, the mileage built in the United States during the year ending December 31, approximates 4518 miles, according to the *Railroad Gazette*. The figure of our contemporary last year was 4804, and in 1899, 4569. Without doubt, however, these figures are all too small, as it is very difficult to get complete reports from any source in many cases. As in 1900, the State which has increased its mileage the most during the year is Texas, which reports 537 miles of track laid, by 16 different companies. Oklahoma Territory comes next in the list with 398 miles reported built during the year, and West Virginia is third with 266. Iowa, Michigan and Missouri also have built more than 200 miles apiece, and there are nine States that have built more than 100 miles, in addition to those named above, as follows: Minnesota, 175; Indiana, 164; Wisconsin, 133; Ohio, 118; Mississippi, 109; New Mexico, 106; South Carolina, 105; Louisiana, 104, and Pennsylvania, 101.

The returns from the companies having new work under consideration were very unsatisfactory, but the following companies reported over 100 miles under way: The Kansas City, Mexico & Orient heads the list with 554 miles in the Southwest located, although it is not all under contract as yet. The Blackwell, Enid & Southwestern has 153 miles building; the El Paso & Southwestern, 143; the International & Great Northern, 130; the Choctaw, Oklahoma & Gulf, 110, and the Missouri Pacific, 102.

The Minister of Railways and Canals, Ontario, gives

the statement that 658 miles of railroad have been completed this year in Canada by 163 companies. Last year this figure was not obtained, hence comparison cannot be given.

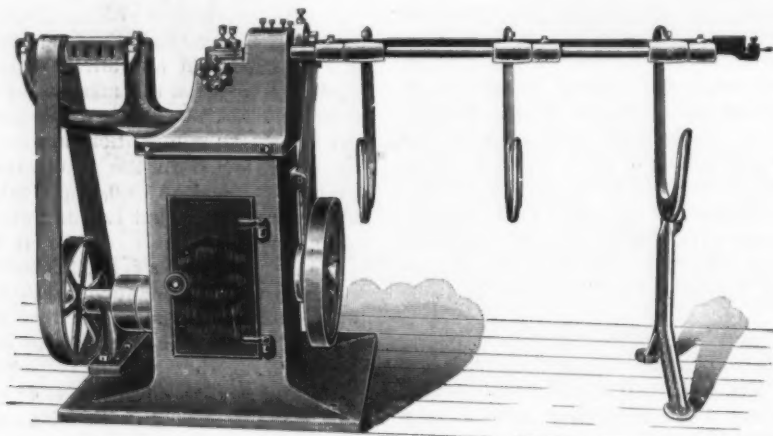
Car Building in 1901

The *Railroad Gazette* reports that during the year 1901 the various car building works in the United States will have built, altogether, 144,267 cars of all kinds, the largest output for any one year, and 20,161 more than in 1900. These figures, of course, do not include cars built by railroads at their own shops. Of the 144,267 cars, 132,591 are freight, 1949 passenger and 4755 street cars for use in this country; and 4359 freight, 106 passenger and 507 street cars for export. The figures for passenger cars include 202, and for street cars a few, for elevated service. Last year the total output of these works was 124,106 cars, as follows: 113,070 freight, 1515 passenger and 6091 street cars for use here; and 2561 freight, 121 passenger and 784 street cars for export. In analyzing the returns it will be seen that a large proportion of the increase over last year is in freight cars, while the output of street cars is less. The primary reason for the latter is, naturally, the lack of demand by the street railroads; but some of the builders of street cars have been kept busy on heavy equipment for suburban electric and

arate buildings will contain the exhibits of the Bochumer Verein and the Rhenish machine and metal factory. The great industrial hall, with its dependent buildings, will cover $7\frac{1}{2}$ acres, the length being 1275 feet, and the width 225 feet. The entire exhibition will contain 110 different edifices and pavilions, and will show the products of 2300 exhibitors. There will be a number of congresses held during the time the exhibition is open, and among them the Iron and Steel Institute will hold its autumn meeting, while the Institution of Naval Architects will participate officially in the Congress of the German Ship-building Society.

The Hoefer Rotary Wire Straightening and Cutting Machine.

The Hoefer Mfg. Company of Freeport, Ill., have designed a machine for straightening and cutting wire accurately to any length up to 24 feet. The length of the wire cut is regulated by the length of the guide bar which extends from the machine. This bar is formed with a groove running its entire length, in which is an adjustable gauge which trips the cut off when the desired length has been fed through the machine. The cut portion of the wire is dropped into forked holders placed under the guide bar. The straightening rollers are laid flat and run side by side, instead of being placed one



THE HOEFER ROTARY WIRE STRAIGHTENING AND CUTTING MACHINE.

elevated service, offsetting the decrease in orders for smaller cars. Of the 136,950 cars built for freight service, 28,143 were either all steel or had steel under frames. The exact proportion of each is not known; but the *Railroad Gazette* estimates that it is safe to say that nearly four-fifths are of steel throughout. Last year the totals were 14,464 all steel and 4140 with steel under frames only. About 1000 of the steel cars built in 1901 were sent abroad.

An industrial exhibition is to be held in Düsseldorf, Germany, in 1902. The site chosen is on the bank of the Rhine, and is of 150 acres area. By the wish of the German Emperor, the Crown Prince has undertaken the office of patron, while the Ministers of Finance, of Education and Commerce, are honorary presidents. On the Executive Committee there are the most eminent representatives of Rhenish-Westphalian industry. The buildings will be of large size and of ornate appearance. Frederick Krupp will have an exhibition palace 405 feet in length, filled exclusively with the products of his own works. Near to it will be the pavilion of the Hörder Verein; opposite to this will be a new and permanent art gallery, and near by will be the great machinery hall. This will be 840 feet long by 156 feet wide, and with annexes will cover 5 acres. The Gutehoffnungshütte and the Deutzer Gasmotorenfabrik will exhibit in adjacent buildings. Next to them will be the building of the Society of Mining Interests, covering an area of $1\frac{1}{2}$ acres. Several structures will be put up by the German Beton Company to illustrate their method of construction. Sep-

arate buildings will contain the exhibits of the Bochumer Verein and the Rhenish machine and metal factory. The great industrial hall, with its dependent buildings, will cover $7\frac{1}{2}$ acres, the length being 1275 feet, and the width 225 feet. The entire exhibition will contain 110 different edifices and pavilions, and will show the products of 2300 exhibitors. There will be a number of congresses held during the time the exhibition is open, and among them the Iron and Steel Institute will hold its autumn meeting, while the Institution of Naval Architects will participate officially in the Congress of the German Ship-building Society.

An Electric Furnace with Magnetic Field.

The *Electrical World* describes a new electric furnace intended for agglomerating iron sand and similar magnetic ores. These ores, the purest source of iron at the command of the metallurgist, are exceedingly difficult of treatment, for their state of fine division not only checks the free passage through them of the furnace gases, but renders them liable to projection from the furnace by the intermittent bursting of the confined gases through the column. To agglomerate the sands into coherent but porous masses, capable of withstanding, until reduction occurs, not only the heat of the furnace but the unmeasured pressure of the supercumbent charge, is a difficult problem, and is further complicated by the necessity of avoiding, in the composition of the binding medium, any elements capable of affecting injuriously the quality of the separated metal. The new plan is to pass through a body of the magnetic sand an electric current of sufficient volume to weld together the contiguous edges of the grains, thus forming a porous mass of pure ore without the use of any cementing medium or the introduction of any additional impurity.

The Eastern Iron Markets.

BY THOMAS HOBSON, PHILADELPHIA.

Pig Iron.

Nineteen hundred and one has been the most extraordinary year that the iron trade has ever known. Extraordinary in the volume of business, in the uniformity of prices, in the increase in production and in the increase in consumption. The gigantic strides made during the past four years are almost incredible. The increase in the production of pig iron during 1897 was 12½ per cent. beyond that of 1896, in 1898 it was 21 per cent. greater than in 1897; in 1899 it was 14 per cent. greater than in 1898; but in 1900 the culminating point appeared to have been reached, the increase in that year being only about 1 per cent. over that in 1899. The record of 1901 is not yet completed, however, but enough is known to make it certain that the increase over 1900 will be at least 15 per cent. Thus for five consecutive years there has been an uninterrupted increase in production aggregating during that period at least 90 per cent. Considering the magnitude of the business it is a record which no other trade and no other country in the world can rival. Moreover, there is nothing to indicate that the onward movement is likely to be checked in the near future. There is more business in sight than there has ever been, there is a larger production, but there is a smaller percentage of iron on hand than has ever been known before, hence it is reasonable to assume that prices during the first half of the year will remain very steady, unless it becomes a runaway market. The fact that prices of ore during 1902 are to remain at practically the same figures as during 1901 is a conservative feature, and, although coke will probably be about 50 cents a ton dearer, the cost of production will not be materially higher than it has been during the year now closing. The iron and steel trades are now of such magnitude, however, and as they cover a much wider area than formerly, it is a difficult matter to diagnose the situation with complete exactness. In referring to the remarks made in our last year's review, however, it is gratifying to notice that the result of the year's business as regards prices closely justified the estimate made. The estimate in regard to production was also in the right direction, but a little too conservative as to the tonnage. We repeat what was said at that time, and believe that the same estimates will be as applicable during 1902 as they were during 1901—viz.: "The fact appears to be established that over \$20 for pig iron leads to excessive supplies, while \$10 to \$12 is too little to bring out sufficient business. It may be assumed, therefore, that somewhere between these extreme figures will be necessary to bring out adequate supplies, and from present appearances to-day's prices are not likely to be changed very much for a long time to come. Contingencies may arise to upset any, or all, calculations; but with such data as there is to work on it seems a fairly safe prediction that \$2 higher or \$2 lower is about the extreme at both ends. It is true that the facilities for production are steadily increasing, but it is equally true that not only is there a great increase in consumption along the old lines, but there are new fields and new lines which have made and will continue to make much heavier calls for furnace products than was thought of two or three years ago. The large interests are not favoring high figures, and they are probably strong enough to so control supplies that they will not permit any appreciable decline unless something entirely unforeseen intervenes. At this time we are on the basis of 1,000,000 tons per month of production. It is not likely to decrease, but may be increased 10 to 15 per cent. more during the next two or three months, with a good reserve capacity behind that if it becomes necessary to use it."

Quotations one year ago were just about as they

stand to-day, so that the swing was a little less than the \$2 mentioned. Prices were fairly steady during the first half of the year, a slight shading from time to time, but the decline was not more than 50 cents per ton. During August, September and October there was a further shrinkage of 50 to 75 cents per ton; September averaged lower than any previous month, but late in October a reaction set in which has continued by easy stages until the present time, when, as we have already said, prices stand just about as they did at this time last year, the extreme variation during 1901 being about \$1.50 per ton. This is a most remarkable record on a whole year's business, which in value was not less than \$250,000,000, yet prices leave off practically unchanged. The record for 1901 may now be considered closed. What are prices going to be during 1902?

In a general way it may be said that the immediate indication are more favorable for an advance than they were a year ago. It is probably safe to assume that 50 cents less than to-day's prices will be about as much decline as will be seen during the first half of the year, and \$1 the extreme limit for an advance. Unforeseen circumstances may materially change this estimate, but with such data as can be had at the present time, the outlook seems to promise a steady and strong market for a long time to come. The amount of work under contract by the ultimate consumers has never been as large as it is to-day, and as stocks of pig iron were never so small, it is difficult to see anything likely to counteract the favorable conditions which now prevail. It would be a comparatively easy matter to advance prices if manufacturers were inclined that way, but conservative feeling is so general that premature or unwarranted advances are strongly deprecated. A little more decline in Europe and a little better prices here would soon open the way to imports, which, as a matter of fact, have already been made of some specialties, with additional quantities under negotiation. Vast as the volume of business is, and is likely to be during the coming year, it is extremely probable that imports would have a very deleterious influence. There is a probability, however, that matters in Europe and in South Africa are pretty close to a turning point, and that manufacturers in Europe will be sufficiently occupied in their own markets to obviate any necessity for making forced sales on this side of the Atlantic. Of course, there is a fair chance that the last half of the year will be as favorable and perhaps more favorable than the first half promises to be, but there are very few that care to express an opinion covering a period for more than six months ahead. The year will begin well, and, following such a long period of unexampled prosperity, the entire country has abundant cause to be thankful for the past and hopeful for the future. The range of prices during the year on the first of each month has been as follows for Philadelphia and nearby deliveries:

	No. 2 X foundry.	No. 2 plain.	Basic.
January ...	\$15.50 to \$16.00	\$14.75 to \$15.25	\$14.00 to \$14.25
February ...	15.50 to 16.00	14.75 to 15.25	14.00 to 14.25
March	15.00 to 15.50	14.25 to 14.75	14.00 to 14.25
April	15.25 to 15.75	14.75 to 15.00	14.50 to 14.75
May	15.25 to 15.75	14.75 to 15.00	14.35 to 14.50
June	15.25 to 15.50	14.75 to 15.00	14.25 to 14.50
July	15.00 to 15.50	14.50 to 14.75	14.00 to 14.25
August	15.00 to 15.25	14.25 to 14.75	14.00 to 14.25
September...	14.75 to 15.25	14.25 to 14.75	14.00 to 14.25
October.....	14.90 to 15.50	14.50 to 14.75	14.00 to 14.25
November...	15.25 to 15.50	14.75 to 15.00	14.00 to 14.25
December...	15.75 to 16.00	15.25 to 15.50	14.25 to 14.50

Exports.

The export trade so far as iron and steel is concerned is practically lost, and it looks as though it might be a

long time before it is recovered. Fortunately we are not suffering for want of it, and, in fact, it could not be handled if we had it, as the home trade for months past has required every ton that could be made. Very few people realize, however, what an inestimable boon the export trade has been to this country, directly and indirectly. It was the export trade that imparted the first impulse toward activity after several years of extreme depression. It was that that accelerated the completion of plants which were in process of construction, caused extensive additions to old plants and also the construction of an entirely new batch, which for magnitude and effective work are unsurpassed anywhere. As it is, the country is heavily handicapped in supplying its own requirements, but what kind of a fix would we be in if the foreign demand had not almost forced us into these extensions and new constructions? There is no doubt that the country has been specially favored in matters of this kind. No matter how many may claim to have foreseen developments of this kind, it is very certain that such favorable coincidences are probably without a parallel. Foreign countries can for the present get along very well without importing iron and steel from the United States, and the United States is still better prepared to do without an export trade; but the time will come when the business will be resumed. How soon that will be and upon what terms it is, of course, impossible to say, but 1902 may have another surprise in store for us. The South African difficulty is liable to be brought to a close at very short notice, and the potentialities in that field, as well as in Northern Africa, are of vast importance. It will undoubtedly lead to the opening up of one of the greatest undeveloped countries on the face of the earth, and that, in connection with the resumption of gold mining operations, may give an impulse to business the world over. There will have to be a readjustment of prices; however, it may be at a higher level—it can hardly be lower, because if business recovers in foreign countries it will certainly be favorable to the American industries, but to what extent remains to be seen.

Billets.

The year has been one of considerable anxiety to consumers of steel. During the first three months prices ran along very smoothly, and with practically no variation. During April premonitions of scarcity began to be felt and there was a jump of several dollars per ton, sales having been made as high as \$27 per ton, as against \$21 to \$22 during the preceding three months. During May, June, July and August, and the first week or two in September, prices remained within the range of \$26 to \$27. From that time on and during October they stood at \$27 to \$28, in November at \$28.50 to \$29, and during the current month anywhere from \$29 to \$30. It is a noticeable feature that during the entire year prices were lower for extended deliveries than for short dates, yet when deliveries were due prices had worked up to what were spot prices at the time of purchase. It would appear, therefore, that manufacturers have been somewhat out of their reckoning, as discounting the future was evidently a mistake so far as regards billets. The same feature continues, however, and steel for six months' deliveries is said to be available to-day at \$28 to \$28.50. Prices for spot steel or thirty-day shipments have been very erratic. The difficulty for many weeks past has been to find a seller and when that was accomplished transactions were usually of a confidential character and depended a good deal on the claim which the buyer could make for consideration. Some steel has been imported and is beginning to arrive. The price is said to be about \$28 on dock, and it will be interesting to see how the steel works, and what prospect there is for further shipments.

Finished Material.

The year which is just closing has in some respects been one of exciting interest, while in others it has been calm and uneventful. The strike in the Pittsburgh district, which was stubbornly contested for a period covering almost the entire summer months, may be said to have finally died with hardly a ripple of excitement. It

is doubtful if there ever was a strike anywhere of such magnitude and as protracted as this was with so little disturbance or ill feeling. It certainly disarranged business, and the effects continue to this day, but it is a question whether it was an advantage or a disadvantage. The loss of wages by the men was a large item, but the curtailment of production during that period laid a substantial foundation for increased business later on, and both capital and labor are securing handsome returns now, and are likely to do so for an indefinite period. Prices in some lines reached abnormally high figures; billets, sheets, boiler tubes and wrought iron pipe were at famine prices, and while the last mentioned are considerably easier now, billets are as scarce and as dear as ever. Early in the year it looked as though there might be a somewhat demoralized market for bars and plates, but this was fortunately avoided by the manufacturers of each of these specialties formulating plans for maintaining uniform prices, which have proved to be eminently successful. It took a good deal of time to arrive at a basis which would be satisfactory to all the various interests, one great difficulty being in the variety of conditions in regard to location of the mills, proximity to markets, cost of production, &c. The plan finally adopted and which has worked perfectly so far, and is likely to be continued indefinitely, was to base all quotations at a figure agreed upon for f.o.b. deliveries in Pittsburgh. The local mills, therefore, quote Pittsburgh prices—plus freights to whatever point the material has to be shipped. An Eastern mill selling in the Pittsburgh district is therefore at a disadvantage of 12 cents per 100 pounds, and *vice versa* if Pittsburgh mills take orders in the Eastern district. The same plan is in force among the plate mills, although it is less binding than that in bars. The plate mills have a verbal agreement, the bar mills have a written agreement, which is further strengthened by a substantial cash deposit. There is also an arrangement by which when any of the bar mills exceed their allotment they have to pay a stipulated sum into the treasury, through which it is distributed among those that have not reached their allotments. This method obviates the necessity of cutting below their fellow members, as they receive compensation as above stated. Structural material manufacturers also have a price agreement, but the capacity for production has been so greatly overtaxed that the price agreement has been of no value. The difficulty the year through has been to get deliveries and prices have usually been somewhat higher than the official quotations.

As regards business during the coming year prospects are extremely satisfactory. It cannot be said that the plate and bar mills are carrying a very large amount of orders on their books, but if business is going to be as active as it promises to be in other lines bars and plates will certainly not fall far behind. It is a fact, however, that there has been a larger increase in the capacity of the bar and plate mills than in their allied interests. The comparative easiness, therefore, is due not to a decrease in business, but to a disproportionate increase in the productive capacity in the lines mentioned. It is believed, however, that if the Subsidy bill goes through, as it ought, shipbuilding will receive a great impetus and the plate trade be benefited accordingly. At the present time the plate and bar mills are about the only interests that appear to be in a condition to meet an increased demand, but it is hardly likely that they will fall far behind if other departments maintain their activity. It is hardly necessary to give a list of quotations, as the price agreement has been maintained during the entire period since it went into effect. For the first three or four months bars sold at from 1.40 to 1.50 cents. The base price for bars was fixed at 1.45 cents, Pittsburgh, in May; it so continued until October, when they were advanced to 1.50 cents. The Philadelphia price, therefore, has been 1.40 cents for the lowest, and 1.62 cents as the highest, which is to-day's price.

Old Material.

The year has been a somewhat difficult one for the dealers, and business methods have been changed so much that it has become largely a matter of specu-

lation. Attempts have been made to get it down to a reasonably safe working basis, but no satisfactory way of doing it has been found so far. It is intimated that the railway interests are less disposed to favor middlemen than formerly, consequently they have had to bid prices up to figures which left little margin for profit, except the market was advancing. This, of course, could not always be the case, so that it has not been unusual for dealers to find themselves loaded up with stock for which there was no market that would afford them a profit. Consumers of iron scrap have been as dissatisfied as the dealers have been, the former complaining that the price was out of proportion for what they could get for the finished product. A short time ago it was proposed (and seemed likely to go through) that the Eastern Bar Iron Association should establish a central purchasing and distributing agency, with the idea of obviating the necessity of mills bidding against each other and thereby advancing prices. It was further stated that a considerable saving in freights could be made by making deliveries with the shortest hauls possible, but the entire scheme seems to have dropped out of sight for the present, although it may be taken up again during the coming month. Prices have been fairly uniform during the entire year, the lowest point being from June to August, the highest being during the last month—No. 1 railway scrap, wrought turnings and heavy melting steel averaging \$2 to \$3 per ton higher than at this time a year ago. The range of the leading specialties on the first of each month was as follows:

JANUARY.

Heavy melting steel.....	\$16.00 to \$16.50
No. 1 wrought scrap.....	18.00 to 18.50
Machinery cast.....	14.50 to 15.00
Borings	7.75 to 8.25
Wrought turnings.....	9.75 to 10.25

FEBRUARY.

Heavy melting steel.....	\$15.50 to \$16.00
No. 1 wrought scrap.....	18.00 to 19.00
Machinery cast.....	14.00 to 14.50
Borings	8.00 to 8.25
Wrought turnings.....	10.00 to 10.50

MARCH.

Heavy melting steel.....	\$15.75 to \$16.00
No. 1 wrought scrap.....	19.50 to 20.50
Machinery cast.....	14.00 to 14.50
Borings	8.00 to 8.25
Wrought turnings.....	10.00 to 10.50

APRIL.

Heavy melting steel.....	\$17.00 to \$17.50
No. 1 wrought scrap.....	19.50 to 20.50
Machinery cast.....	14.00 to 14.50
Borings	8.75 to 9.00
Wrought turnings.....	12.00 to 12.50

MAY.

Heavy melting steel.....	\$16.75 to \$17.00
No. 1 wrought scrap.....	19.00 to 20.00
Machinery cast.....	14.00 to 14.50
Borings	8.50 to 9.00
Wrought turnings.....	12.00 to 12.50

JUNE.

Heavy melting steel.....	\$16.00 to \$16.25
No. 1 wrought scrap.....	19.00 to 20.00
Machinery cast.....	13.50 to 14.00
Borings	8.50 to 9.00
Wrought turnings.....	11.75 to 12.25

JULY.

Heavy melting steel.....	\$16.00 to \$16.25
No. 1 wrought scrap.....	19.00 to 20.00
Machinery cast.....	13.50 to 14.00
Borings	8.50 to 9.00
Wrought turnings.....	11.75 to 12.25

AUGUST.

Heavy melting steel.....	\$15.75 to \$16.00
No. 1 wrought scrap.....	17.50 to 18.00
Machinery cast.....	13.75 to 14.00
Borings	7.25 to 7.50
Wrought turnings.....	11.50 to 12.00

SEPTEMBER.

Heavy melting steel.....	\$16.50 to \$16.75
No. 1 wrought scrap.....	17.75 to 18.00
Machinery cast.....	13.75 to 14.25
Borings	7.25 to 7.50
Wrought turnings.....	11.50 to 12.00

OCTOBER.

Heavy melting steel.....	\$16.75 to \$17.00
No. 1 wrought scrap.....	18.75 to 19.50
Machinery cast.....	13.75 to 14.00
Borings	7.25 to 7.75
Wrought turnings.....	11.75 to 12.50

NOVEMBER.

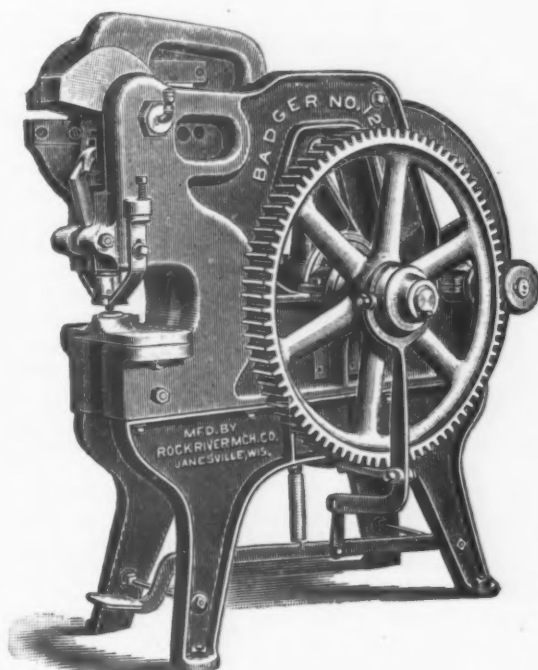
Heavy melting steel.....	\$17.00 to \$17.50
No. 1 wrought scrap.....	19.50 to 20.50
Machinery cast.....	14.00 to 14.50
Borings	7.75 to 8.00
Wrought turnings.....	11.75 to 12.50

DECEMBER.

Heavy melting steel.....	\$17.50 to \$17.75
No. 1 wrought scrap.....	14.00 to 14.50
Machinery cast.....	14.00 to 14.50
Borings	8.00 to 8.25
Wrought turnings.....	12.75 to 13.25

The Badger Punch and Shear.

We illustrate herewith a new type of punch and shear manufactured by the Rock River Machine Company, Janesville, Wis. The machine is designed for heavy



THE BADGER PUNCH AND SHEAR.

work as well as light. The main frame is made of two parts, which are planed to form practically one solid piece when bolted together. The lever in which the knives are fastened is planed to work free and easy, and is actuated by a large eccentric.

The die is separate from the die block, which is held in place by two screws on the end, doing away with the clamps usually used for this purpose, which enables the operator to punch any piece with an elbow or angle much nearer the corner than by the old style. The machine has three sets of knives made of fine steel, which are carefully fitted and tempered and are held in place by steel screws. The round iron knives are so constructed as to not flatten the iron, but to leave the ends round and smooth. The punch is held in place in the plunger by a steel coupling, thereby doing away with set screws. This machine will cut $\frac{1}{2}$ x 4 inch flat iron, $1\frac{1}{8}$ -inch round iron, and punch a $\frac{3}{4}$ -inch hole in $\frac{1}{2}$ -inch iron or their equivalent. It occupies a floor space of 4 square feet and weighs 2000 pounds.

A report from Atlanta, Ga., states that deposits of asbestos have been discovered on the property of Lieutenant Wilmer O. Chrisman, near Atlanta, and that they will be developed.

Iron Ore Matters.

DULUTH, MINN., December 28, 1901.—It looks as though the Mesaba producers, who a year ago sold ore at extreme low prices, had made a mistake that will be hard to recover from for some time. The ores of this range will, the coming year, sell at slightly lessened differential from other ranges than in 1901, but the difference is still far too marked for an ore that is being used in such proportion of furnace mixtures as the Mesaba is to-day. Average furnace work is showing 40 per cent. Mesaba in the mixture, this including every furnace in the region supplied by Lake Superior, though a considerable number of furnaces are using very little and some none at all of Mesaba ores. Actual furnace use of Mesaba ore where it is supplied under favorable conditions runs, of course, far higher, and 75 to 85 per cent. is not uncommon or remarkable. By the continued purchases of Mesaba ore lands and mines by consumers the market for independent ores of the range is being considerably restricted. These purchases have been frequent during the year and are still under way, while negotiations are said to be progressing by steel making concerns that have heretofore manifested no particular anxiety about their ore supplies. This is done, although there is no difficulty in making contracts for ore at going low prices to cover requirements for a term of years.

Almost every concern that has bought ore lands on the Mesaba range has been favored by the fact that development has shown more ore, in many cases an enormous quantity more, than was estimated at the time of purchase, though then explorations had been supposed to show the ore bodies. Two notable examples of this in very recent operation are the Sharon Ore Company's developments in 20-58-19, and those of the Interstate Mining Company (Jones & Laughlins) in the same section and in the Virginia district. The United States Steel Corporation can point to numerous notable examples of this fact, which, though not unexpected nor unusual elsewhere, is particularly marked upon the Mesaba range.

There has been much talk of ore charters on the lakes for 1902, and the Pittsburgh Steamship Company (United States Steel) have been reported as making numerous charters for the year. Vice-President Wolvin, who has just returned from the East, states that this talk is premature, and that the company have made no charters and will probably make none for some time to come. The company have laid up the bulk of their fleet at Duluth and Cleveland.

The Cleveland Cliffs Iron Company, though they dropped some mines that last year added to their production, have increased over any preceding season and close 1901 with a production of 1,148,202 gross tons. Of this the Ishpeming mines shipped 861,803 tons, a reduction of about 20,000 tons from the preceding year, and the Ashland mine, Gogebic range, which went under this company's control early in the year, 286,399 tons, an increase of 54,000 tons. At the Volunteer mine the new owners are now lifting water and preparing for underground work as soon as it can be carried forward. It is expected that the Breitung Estate will commence diamond drilling at the Negaunee lands recently cleared in the courts of a claim to leasehold by the Cleveland Cliffs Company. Ore is known to exist upon the lands, though what was found there in early days would not now satisfy mine operators.

The shipments of the Crystal Falls district of the Menominee range for 1901 and 1900 have been as follows:

	1901.	1900.
Crystal Falls.....	230,000	197,770
Great Western.....	143,000	98,550
Armenia	18,000	.....
Tobin	18,000	.....
Hemlock	147,000	72,413
Mansfield	75,000	90,155
Columbia	20,000	97,531
Bristol	36,000	51,639
Hilltop	2,500	6,410
Monongahela	2,500	.....

The four first named are Corrigan, McKinney & Co. properties, and have made shipment of 409,000 tons; Hemlock is a promising property of Pickands, Mather & Co., and is increasing rapidly; the Mansfield and Co-

lumbia were bought by the Oliver Iron Mining Company during the year and will make a far larger output another year than they have this; the Bristol belongs to Oglebay, Norton & Co., and was idle all last winter, or would have made a larger shipment. The Hilltop is a legacy of the United States Steel Corporation from the American Steel & Wire Company, and the Monongahela is the new property of Jones & Laughlins, which is now under development.

The new shaft at Great Western is going down at the rate of 60 feet per month, and last month the sinking aggregated 70 feet. At the old Dunn the same operators are commencing shaft sinking and propose to go down 800 feet to the ore body. Both the Tobin and the Armenia are looking well as depth and development are continued.

The United States Steel Corporation's mines in Iron County, Mich., have been consolidated in one district with J. S. Wall as superintendent. The Crystal Falls mines of the company are to be under the immediate charge of S. C. Bennett, while Mr. Wall will oversee the Iron River and Amasa, Michigan and Gibson properties.

Mining will continue all winter at the Helen, Michipicoton range, and about 2000 tons a day are now mined, crushed and stocked on the side of the high hill above the railway tracks. It is not expected that the Josephine mine of the same district, and 10 miles further inland, can ship much if any ore the coming year on account of the impossibility of getting machinery in advance of the railroad, which will not be there before the coming season. Attention will probably be turned shortly to the vast mass of siderite forming one of the walls of the Helen hematite deposit and some results are expected from this carbonate. This material assays as high as 37 per cent. iron as it stands.

The Steep Rock Lake District.

There is just now a great iron ore excitement in the vicinity of Steep Rock Lake, north of the Minnesota line, and on the route of the new Canadian Northern road, almost due north from Ely, on the Vermillion range. References have been made to the finds of the fall there, but the whole story of the discoveries has not come out. It seems that immense areas of land, supposed to be on the formation, have been taken by various Canadian mineral and railroad interests and by concerns on the United States side of the line. A number of contracts have been let for winter development and many crews are now there to sink pits and do drilling in the region. The ore found there is a high grade hematite, and some assays have shown phosphorus as low as 0.017, with but a trace of the sulphur that has proved such an obstacle to other ore fields in the same general region. Machinery houses at Duluth have very lately shipped considerable prospecting and preliminary mining machinery there, and another spring will determine to an important extent the value of the discoveries. Reports coming down from there are that there is even now in the depth of winter a very active scramble for properties and much exploration in that vicinity.

At the steel rail mills of the Clergue Syndicate at Sault Ste. Marie, Ont., parts of the buildings are under roof, and have been for some time. Roofs on the rest have been delayed by the lack of material, but the American Bridge Company, who have the contract, are now getting to work. The mill might be making blooms in a few days, were that desirable. All the machinery to complete the plant is on hand and will be set up as soon as the roofs are on. The buildings are stone and steel. Electric handling of material and product will be carried to a further point in these new works than in any now in operation.

The latest development in connection with the Clergue enterprises is the building of saw mills on the line of the Algoma Central & Hudson Bay Railroad and at the Sault, to cut pine and spruce lumber from timber growing on the grants of the company. These mills will be built at the points where the road crosses large rivers running through the company's grant to Lake Superior and will divert timber from these streams. A mill to cut 50,000,000 feet annually will be erected at the Sault, and both logging and sawing operations will be in

such harmony with the pulp mill enterprises of the company that the utmost economy and efficiency will result, and an excellent product will be made. The works for the desulphurization of pyrrhotites and the saving and utilization of the sulphur fumes in the arts and in paper making are now in operation and are turning out a large product. These works have been referred to in this correspondence heretofore as under construction. The company's large sulphite pulp mill, to operate in connection with these works, is also running and making a high grade pulp in large quantity. Contracts have been let for the construction of wood carbonizing plants for handling 300 cords of hard woods daily and for the treatment of the pyroligneous acid, &c., resulting and work has commenced on these. The foundations for stoves and blast furnaces are completed and the erection of shells for stoves is under way. A dock 2800 feet long, for the reception of ore, coal and lime, is started. This will be of sufficient width so that a storage yard 500 feet wide and the length of the dock will be possible, and material will be handled by an overhead traveling hoist.

D. E. W.

Publicity and Stock Companies.

The charter of the Atlantic Rubber Shoe Company, recently incorporated in New Jersey, contains some features which aim to conform to the demands considered just in connection with stock companies and consolidations. Chief among these is the requirement for greater publicity on the business affairs of such corporations. James B. Dill, who is of counsel of the Atlantic Rubber Shoe Company and who has been a foremost advocate of reform in this particular respect, has drawn up the following:

"The company and their directors and managers thereof shall cause to be kept proper books of account, in which shall be kept full, true and complete accounts of the affairs and transactions of the company; and shall once at least in each year, and at intervals of not more than 12 months, cause the accounts of the company to be balanced and a shareholders' balance sheet to be prepared; shall cause a copy of such shareholders' balance sheet to be laid before the stockholders at the annual meeting, and a copy to be deposited at the registered office of the company for the inspection of the stockholders in person during a period of at least seven days before the meeting.

"The shareholders' balance sheet shall be in such form as may be from time to time directed by the stockholders, and shall in every case contain:

"The amount of the capital issued and the amount paid up thereon, distinguishing the amount of capital paid up in money and the amount paid up otherwise than in money, and the arrears, if any, of calls due.

"The amount of debts due by the company, distinguishing the amount of mortgages and lien charges upon the general assets of the company; the amount of debts due the company after making a proper deduction for debts considered to be bad or doubtful.

"The actual amount of surplus (if any) and the nature and mode in which it is used and invested.

"The amount by which the gross value of the assets of the company has been increased since the last balance sheet in consequence of any increase in the valuations of real or personal property belonging to the company."

The charter of the Atlantic Rubber Shoe Company contains also the following interesting provisions in regard to a sinking fund for the preferred stock:

"The holders of the preference shares shall be entitled to receive, when and as declared by the Board of Directors, from the surplus or net profits of the company, cumulative preferential dividends at the rate of 6 per cent. per annum and no more, payable semiannually, on days to be prescribed by the by-laws. After providing for the payment of all accumulated dividends upon the preference shares, at the rate of 6 per cent. per annum, the remaining surplus of net profits, as determined by the Board of Directors, shall be applied as follows:

"Twenty-five per cent. of such remaining surplus or net profits shall be set aside and paid into a sinking fund for the purpose of redeeming the preferred stock. Such sinking fund shall be managed and invested as provided by the Board of Directors, and the same may be invested in the preference shares of the company if deemed advisable by the Board of Directors, and all of the preference shares and any shares thereof shall, at any time after three years from the issue thereof, be subject, in the absolute discretion of the Board of Directors, to redemption and discharge at the price of \$120 for each share, and in addition thereto of all accrued dividends thereon. The manner in which such redemption shall take place shall be provided by the by-laws.

"After providing for the payment of all accumulated dividends upon the preference shares at the rate of 6 per cent. per annum, and after setting aside 25 per cent. of the remaining surplus or net profits for a sinking fund, as hereinabove provided, the directors may, in their discretion, declare and pay dividends from the remaining surplus or net profits upon the common shares.

"The Board of Directors may, in their discretion, declare and pay dividends on the common shares concurrently with dividends on the preference shares for any dividend period of any fiscal year when such dividends shall have been earned and are applicable to the common shares, provided, that all accumulated dividends on, or belonging to, the preference shares for the previous fiscal years and previous dividend period for that fiscal year, shall have been paid in full, and all sinking fund installments shall have been paid or set aside, as hereinabove specified.

"The foregoing provisions for a sinking fund and for the purchase, call and redemption of the preference shares shall be applicable until all of the preference shares of the company shall have been redeemed; and the methods by and manner in which such provisions shall be exercised shall be prescribed from time to time by the Board of Directors, and such action shall be final and conclusive; provided, however, that an affirmative vote of a majority of the whole board shall be necessary to validate such action."

Award of Nobel Prizes.

United States Minister Thomas has reported to the State Department that the first award of the Nobel prizes, for which the late Alfred Nobel, the discoverer of dynamite, left practically the whole of his fortune, was made at Stockholm and at Christiania on December 10. These prizes consisted of five allotments, each of more than \$40,000, to be awarded to persons, irrespective of nationality, who have done the most for the benefit of mankind. The awards were as follows:

In physics, to Wilhelm Conrad Roentgen, professor at the University of Munich, the discoverer of the Roentgen rays; in chemistry, to Jacobus Henricus Van't Hoff, professor at the University of Berlin; in medicine, to Emil von Behring, professor at Halle, the discoverer of the diphtheria serum; in literature, to Sully-Prudhomme, member of the French Academy. In the works of peace the prizes were divided between Frederick Passy, National Economist of France, and Henry Dunant of Switzerland, the leading spirit in bringing about the Geneva convention and in instituting the societies of the Red Cross.

The prize diplomas were publicly awarded by the Crown Prince of Sweden at Stockholm, and at Christiania the presentation was made by the Norwegian Storting at a special session.

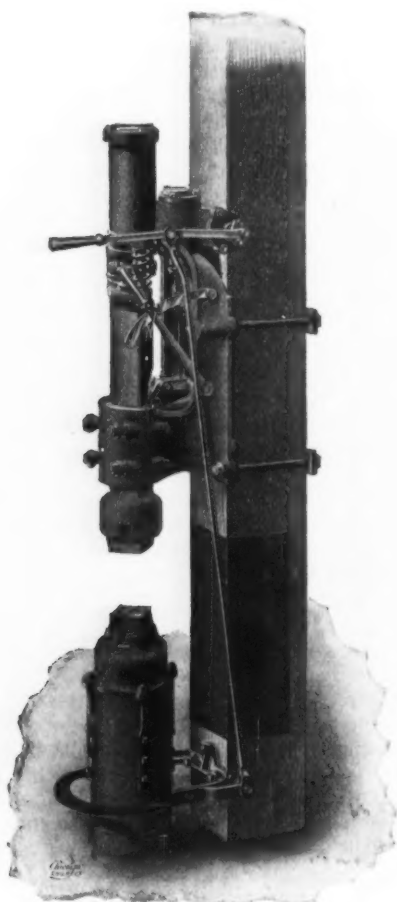
Schneider & Co. of Creusot, France, are building a blast furnace plant at Certe. The first furnace will soon be completed.

A seat on the New York Stock Exchange was sold last week for \$80,000, which is \$5000 in excess of the previous high record price.

New Post Hammer.

The American Engineering Works, Chicago, have recently designed a small post hammer, to be operated by steam or compressed air. This hammer is particularly well adapted for all classes of general blacksmith shop work. It works very quickly, will turn out a large amount of work per day, and is thoroughly satisfactory for all forging work $2\frac{1}{2}$ inches in diameter and smaller. This hammer will be found to be an extremely useful tool for railroad, blacksmith and shops generally where any forging work is required. The illustration shows the hammer attached to a post with anvil supported independently.

The action of this hammer is the same as that of a large steam hammer. The ram can be regulated to strike a blow of the full force developed by the falling weight with the momentum due to the pressure of the



NEW POST HAMMER.

steam or air behind it, or it can be regulated so as to give the lightest possible blow, merely touching the object on the anvil without doing any work.

The cylinder is 3 inches in diameter by 10-inch stroke. It is cast in one piece with the frame from the best quality of gray iron. The exhaust ports are arranged so as to keep the cylinder always drained. The valve is under perfect control of the operator, and is operated by a foot treadle or by hand lever. Steam valve is controlled by a cam working on a cam path on the back of the ram, the position of the cam being governed by the operating levers. A safety device is also provided to limit the stroke of the piston. There is clear space of about 10 inches from center of die to side of post supporting the frame.

The hammer is usually arranged for bolting to a wooden post 8 x 8 inches. Special attachments can be furnished for bolting to I-beam or other form of wrought steel column, or where preferred a steel column made of extra heavy wrought pipe will be furnished, together with necessary clamps for properly clamping frame of hammer.

The ram is a solid steel forging, square in form where it passes through the lower part of the frame, which acts as a guide. The lower end of the ram is arranged to receive the upper die in such position that it stands at an angle of 45 degrees to the post supporting the hammer, thus enabling long pieces to be worked either way of the die without coming in contact with the post. The upper die is a steel casting, having a face 4 x 5 inches, dovetailed to the ram and fastened with wedges. The lower die is a steel casting, having face 4 x 5 inches, dovetailed to the anvil and fastened with wedges, so that it is easily removable. The anvil is designed to be secured to a 12-inch wooden block set on end, the anvil being bolted to the block with lag screws.

The falling weight is 100 pounds. The weight of the lower die and anvil is about 150 pounds. The total weight is about 575 pounds.

Trade Publications.

Small Tools and Standard Gauges.—A very comprehensive catalogue covering the small tool department of the Pratt & Whitney Company of Hartford, Conn., has been received. The tools consist of die stocks, United States or Whitworth standard, taps and dies, a large line of milling cutters, drills, reamers and punches, standard size thread gauges and gauges for special purposes. In order to extend the general adoption of a standard system of screw threads throughout the United States the company have at great expense, and by the employment of the best methods attainable, endeavored to solve the problem in regard to producing standard gauges, both United States and Franklin Institute threads. With the facilities now at hand they can furnish gauges which are interchangeable as to size and character in angle and pitch of thread. The Sellers system, recommended by the Franklin Institute, has been adopted by the United States Government, master mechanics, Master Car Builders' Association, locomotive works, machine makers, bolt makers and many manufacturing establishments throughout the country. This thread, as is well known, has an angle of 60 degrees with flat top and bottom equal to one-eighth of the pitch. The advantages of this form of thread over the sharp V are that in the tap the edges of the thread are less liable to accidental injury and will wear and retain their size and form longer, and in the bolt the flat top and bottom give increased strength and improved appearance.

Boring, Punching and Shearing Machinery.—A catalogue of the Long & Allstatter Company of Cincinnati contains very complete descriptions of the various punching and shearing machines built by them. Their standard machines are designed to do all kinds of punching and shearing and are made single and double with throats any depth between 4 and 72 inches. The sides of the double machines are entirely independent of each other, so that one set may run while the other is idle, or both sets may operate at the same time. The form of the regular machines is modified in various ways by rounding the end of the lower jaw for boiler work, by widening the slide for gang work, by enlarging the openings in the lower jaws for tube and flue hole punching, by dividing the lower jaw so as to pass the beams, and in various other ways adapting them to a great many different kinds of work. The single machines are furnished with a regular set of punching tools, or a pair of cross or split shears, and the double machines are furnished with a set of tools, punches or shears for each side. Special punches or shears for angles and special shapes may be used on any of the regular machines. The cam shear pintles are made of steel and the main journal bearings and cam pintles are bushed with bronze, and bronze gibs are provided to take up the work on all the slides. The clutches have renewable steel faces. Levers in front of the machines enable the operators to turn the cam shafts by hand for convenience in adjusting the tools.

Lathes.—We have received from the F. E. Reed Company of Worcester, Mass., catalogue describing the

many types of lathes built by them. They make a specialty of the manufacture of engine lathes, from 12 to 30 inches swing, and have lately redesigned all these tools and made new patterns for them during the last year, enlarging their proportions throughout in order to secure greater power and strength. One of the important changes made is the use of genuine babbitt metal for spindle bearings in place of cast iron, bronze or gun metal. In the cast iron boxes these bearings are dovetailed milled slots. The babbitt is then cast into the box and bored out, after which it is compressed sufficiently to fill out any shrinkage there may be and to make it more condensed. It is then rebored and reamed and hand scraped to fit the spindle as perfectly as possible. Made in this way nothing but the babbitt comes in contact with the spindle.

Lathes.—In a very elegant catalogue issued by the Lodge & Shipley Machine Tool Company of Cincinnati, Ohio, the fact is emphasized that they manufacture only lathes and their attachments. Each piece of each size of lathe, no matter how small, has been made the subject of careful study and development, and thousands of dollars have been spent in getting ready to manufacture each size before the first one of the size is made. This concentration of effort on the manufacture of lathes solely permits each of their machinists to become an expert in his special line. For instance, certain men turn cone spindles from one year's end to the other; other men turn pulleys; other men plane beds, and so on. Each man, therefore, becomes the most expert possible, and does not jump from one character of work to another. The screw cutting feature of these lathes has many points of excellence. All gearing is cut from the solid. The change gears are mounted on a short shaft, the bearings of which are ground, running in special bearings in the bed and located directly under the head stock. This gear may be dropped into any one of the cone gears instantly, and thus gives four times as many changes as there are gears in the cone of gears, because on the outer end of the cone gear shaft are four gears, into any of which the gear on the lead screw may engage. Not a single gear is ever removed to obtain the different threads or feeds on the index.

A circular has been received from the Crosby Steam Gauge & Valve Company of Boston, Mass., dealing with their steam appliances, gauges, pop safety valves, indicators, pressure recorders, &c.

The Whitlock Coil Pipe Company of Hartford, Conn., describe their American separators and exhaust heads in a recent pamphlet.

The Colorado Iron Works Company of Denver, Col., describe mine ore concentration and practice, together with an account of the new iron top Bartlett concentrator, in a late pamphlet.

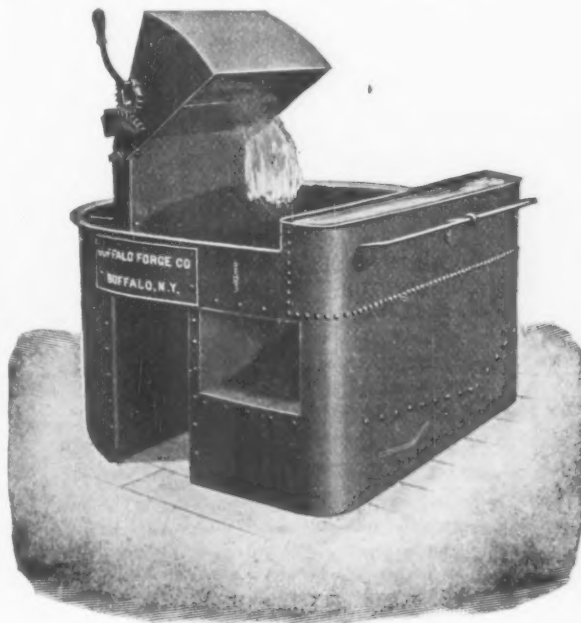
A Belt Driven Wet Drill Grinder.

The Wilmarth & Morman Company, Grand Rapids, Mich., have just brought out a belt driven wet drill grinder as an addition to their line of New Yankee drill grinders. These grinders, as illustrated and described in *The Iron Age* of October 31 last, are designed for the perfect grinding of twist drills by such simplified machinery that no skilled mechanic is required to operate them, as there is no intricate adjusting apparatus. Principles have been embodied in the design of these tools which are claimed to grind drills theoretically and mechanically correct. The new belt driven wet grinding machine has a capacity for grinding $\frac{1}{8}$ to $2\frac{1}{2}$ inch drills. The water is raised to the wheel by a centrifugal pump, and is applied just above the drill point, flooding it completely, so that there is little possibility of drawing the temper even when grinding heavily. The water is returned by the pipe leading from the bottom of the wheel case, and a rubber tube connected to the back end of the holder takes care of the small amount that trickles down the bottom of the vee. The returning water first enters a settling space where the heavy grindings remain, so that when reaching the pump it is again clean. There are no bearings of any

kind under water, or in any way exposed to grit or wet, so that, though a wet grinder, the life of the machine is not thereby shortened. This machine can be fitted with an attachment for grinding the four to eight lip agricultural reamers now so extensively used for reaming cored holes.

The Buffalo Improved Forge.

By the down draft method of forge construction, as introduced by the Buffalo Forge Company of Buffalo, N. Y., the smoke and gases are immediately and completely withdrawn by means of the down draft suction through an adjustable hood and underground tile piping. Indeed, there is no escape of gases, fumes or smoke from the larger fire. The cast iron hoods are adjustable to different positions, according to conditions at the fire. Fumes of hard coal, coke and furnace fires, which are a menace to the smith's health, are rapidly eliminated by the thorough exhaust, and the forge shop atmosphere is as pure as the best ventilated machine shop. The valuable space and light about the forge are not obstructed



THE BUFFALO IMPROVED FORGE.

by inefficient telescopic hoods, which are subject to frequent renewals.

The illustration shows the latest design for the Buffalo down draft forge. This forge stands 27 inches to the top of fire pan, which is $24\frac{1}{2}$ x $47\frac{1}{2}$ inches. It has a water tank 6 x 47 inches and 10 inches in depth, and a coal box 10 x 14 inches and $47\frac{1}{2}$ inches long. It is also furnished with tool rack, a blast gate, an improved anti-clinker dumping tuyere, and down draft smoke exhaust hood. This forge, with the exception of the down draft hood and anti-clinker dumping tuyere, which are of heavy cast iron, is constructed entirely of heavy gauge steel plate, and is thoroughly braced. It is best adapted to medium work, and also well suited to light and heavy forging.

Rapid Transit Tunnel Extension.

The commission appointed by the Supreme Court to consider the advisability of extending the New York rapid transit system by a tunnel from the City Hall to the Battery and thence under the East River to Brooklyn, regardless of the consent of abutting property owners and in accordance with the plans of the Rapid Transit Commission, have reported in favor of the plan. The Commissioners are in favor of the two-track tunnel to the Battery, because a four-track tunnel would be too expensive for the city just at present. The Rapid Transit Commission's plans are approved in every particular.

The Bayley High Speed Engine.

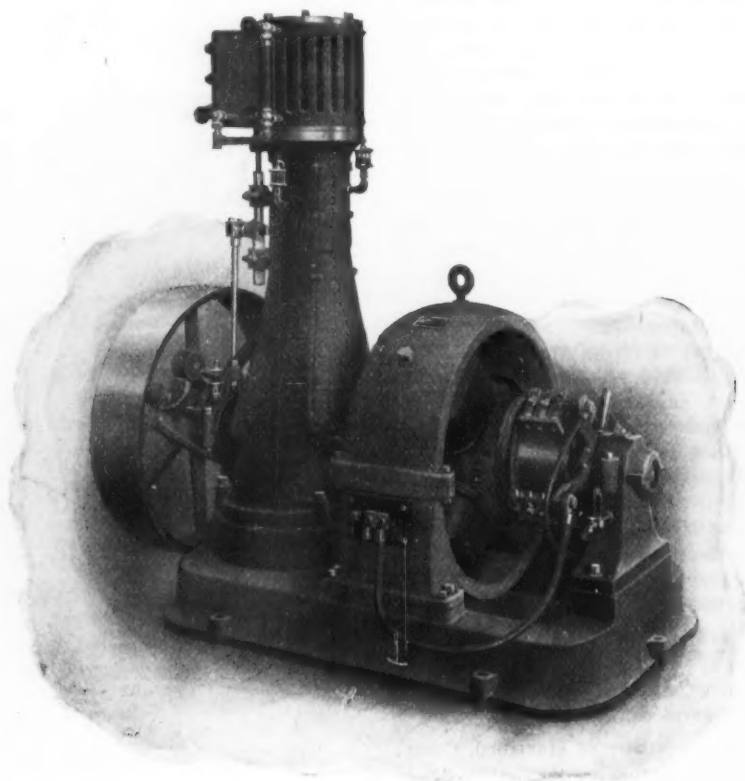
The Wm. Bayley & Sons Company, Milwaukee, Wis., have recently brought out a line of high speed engines designed particularly for electric lighting and power purposes. The vertical engine is herewith illustrated, connected directly with a dynamo. This engine is self contained, is of simple and compact construction. Its efficiency and compactness have not been sacrificed in developing maximum horse power with minimum floor space, which makes it desirable for marine or isolated plants.

The valve is of the box type, with a balance plate on the back, relieving the valve of 80 per cent. of the pressure. It is self adjusting and collapsible, and acts as a relief valve if water enters the cylinder. The governor is composed of two distinct parts, the valve driving and the governing mechanism. The valve driving eccentric, over which the valve travel is made to correspond in ex-

which the waste oil and water are drained. The vertical engines are built in sizes from 2 to 50 horse-power, and the horizontal types from 25 to 140 horse-power.

Iron Manufacture on Lake Superior.

The manufacture of iron and steel in the lake region bids fair to grow very rapidly. Several important projects are under consideration and some have reached the point where they are well along toward consummation. At the Sault the Clergue syndicate are completing a rail mill that is designed, when completed, to handle 1000 tons of product daily. It should be making 600 tons a day in a very short time. A pair of charcoal furnaces that will do considerably better than 300 tons a day, if the hopes of the builders are fulfilled, are under way and a large coke furnace plant is in contemplation.



THE BAYLEY HIGH SPEED ENGINE.

tent and relationship with the motion of the crank, is mounted on the shaft in such a way that a range of cut off from three-quarter stroke as the latest to zero cut off as the earliest may be established. The governing mechanism controls the point of cut off by resetting the valve driving mechanism, which has resident stability sufficient to perform the valve driving work with absolute certainty and truth of motion. The construction is such that the speed can be readily adjusted to a specified number of revolutions by adding or removing a few ounces of weight to or from the governor weights, preserving the same character of regulation. The crank shaft is forged steel of one piece, and the crank pin and bearings are of liberal proportions, accurately finished and counterbalanced with cast iron disks. Provision is made for oiling all the working parts by sight feed oil cups of multiple oiler systems, thus rendering the engine especially adapted to long, continuous work.

The frame is constructed of cast iron, well proportioned for strength, with the metal distributed where it is most needed. The end of the frame and the cross head guides being machined at one setting, the perfect alignment of the cylinder and guides is assured. The frame is supported on a heavy sub-base, which is ribbed inside, and is so constructed as to form a large reservoir into

At Marquette the Cleveland Cliffs Company have commenced a charcoal furnace to make 150 tons per day, and are improving their two other furnace plants at Gladstone and Marquette. The company have announced their plans no further ahead than construction compels, but it is no secret to say that their intention is to become a far greater factor in the making of iron and steel than has yet been indicated. This company hold their own mines, seven in the Ishpeming district; have their timber lands for charcoal, more than 200,000 acres of heavily wooded area; own their own railroad from mines to docks and furnace, to timber limits, and through a large area of arable and fertile country; have their steamships for ore carrying to lower lakes, and are in splendid position to take whatever steps they may desire for the furtherance of the interests of the district in which they are located.

At Ashland the charcoal furnace of the Ashland Iron & Steel Company has recently passed into the hands of the Berry Bros. of Detroit, who are planning extensive improvements and enlargements, both to the carbonizing and pyroligneous plants and to the iron making departments. Some other plans for iron and steel making on the lake are under consideration and are expected to go through later.

A Federal Corporation Law

WASHINGTON, D. C., December 31, 1901.—In connection with the deliberations of the Industrial Commission concerning the recommendations for legislation which are to be incorporated in the Commission's forthcoming report to Congress on the trusts, the interesting fact is developed that an executive session was recently held for the purpose of receiving an elaborate opinion delivered in the form of an argument by F. J. Stimson, advisory counsel to the Commission, which was intended to point out the best method of regulation and restriction that might be provided by Congress for the control of industrial combinations. Mr. Stimson is a well-known lawyer whose practice has made him especially familiar with the corporation laws of New York and New England, and, with a view to assisting the Commission in its work, he made a special study of the statutes of New Jersey, Delaware, West Virginia and other States that have held out inducements for the organization of large corporations within their limits. While he discussed the entire subject in a very comprehensive manner, the trend of his argument is strongly toward the enactment of a national charter law administered by a Federal bureau, clothed with power not only to collect the tax imposed by the charter law, but to regulate the corporations within certain prescribed limits and to insure the fullest possible publicity for their operations.

Taking up the various suggestions for legislation for the restriction of the trusts that have recently been proposed, Mr. Stimson classified them under ten separate heads, as follows:

"1. That foreign corporations should be forbidden to do business by the States.

"2. That monopolistic combinations, even if the aggregation of capital be made into a single corporation, should be prohibited or annulled by State law.

"3. Making destructive competition—i. e., discrimination, or cutting rates in one locality for the purpose of destroying a local competitor—either criminal or penal, and giving the person injured damages; this both by State and Federal legislation.

"4. General publicity of the documents of organization, the stock books and the annual reports of operations, and balance sheets of assets and liabilities. This, also, perhaps, to be by both State and Federal law.

"5. The creation of Federal corporations to do any kind of interstate commerce, in whole or in part, to whose standard State corporations doing such business must or may conform, if, indeed, they are not prohibited by the act of Congress proposed.

"6. As related to this the national regulation of all corporations doing any interstate business, by a national bureau of industry, reports for taxation purposes, or other machinery.

"7. The strengthening of the Interstate Commerce Commission, and perhaps of the anti-trust laws.

"8. The relinquishment to the States by Congress of the power of legislation as to corporations or combinations conducting interstate commerce business other than as agencies of transportation.

"9. The lowering of the tariff, especially in industries affected by trusts.

"10. The denial by Congress to any State corporation, shown to be obnoxious, of the right to do interstate business with its various agencies, of the right to the use of the mails, of the right to sue in the Federal courts, coupled with heavy franchise taxation by the Federal Government, graded, if necessary."

After touching briefly upon these proposed remedies Mr. Stimson took up the proposition that Federal corporations be created as the simplest and best solution of the problem, and suggested the following as the enactment clause:

"Any State corporation engaged in interstate commerce, or any number of citizens of the United States desirous of forming a corporation for the purpose of engaging in interstate commerce, either by the transportation of persons or property, or by other traffic or commerce among the States, may be organized as a

Federal corporation under this act, and as such may sue or be impleaded in the Federal courts, and such corporation shall not be subject to taxation under the laws of any State except as to property actually situated within such State."

As to the constitutionality of such a provision as that quoted Mr. Stimson gave it as his opinion that it would be sustained by the courts.

"It rests, of course," he said, "on that clause of the Constitution which gives Congress power to regulate interstate commerce, or, as in terms it says, commerce between the States and foreign nations. That latter part is a separate clause of the paragraph of the Constitution and I will leave it out, because I do not suppose there is as yet any serious apprehension that any foreign corporation will come in as a trust or a powerful corporation in this country. We will merely take that clause which imposes the full power to regulate interstate commerce upon Congress. That phrase has been interpreted in a great many ways, and one of the great results that we have got from our hundred years' work of the Supreme Court on that clause of the Constitution is that it is clearly shown that constitutional power does cover the instrumentalities of commerce. The Supreme Court of the United States has held that this clause of the Constitution covers the instrumentalities of commerce as well as the commerce itself. The decisions on that point so far go mainly, if not solely, to what you might call the tangible instrumentalities—that is, the railroads and the steamboats, and the bills of lading and documents sometimes. But I think that phrase will be held, when the time comes, to cover as well the instrumentalities which do the business, if it be unquestionably interstate. That is, it will be held to cover the artificial being which does the business, at least in so far as its ordinary functions are concerned. On the other hand, it is equally clear that the Supreme Court has held in many quite recent decisions that manufacturing *per se* is not interstate commerce, no matter how completely the goods manufactured do in fact become, or even are intended to become, the subject of interstate commerce."

A Definition of Interstate Commerce.

It will be observed that the proposed statute, a section of which is above quoted, does not undertake to define what constitutes interstate commerce, and Mr. Stimson stated frankly that this omission was intentional.

"On the one hand," said he, "you have a doctrine that the instrumentalities of the commerce may be regulated; so I advise that Congress may regulate the creation and operation and taxation of those corporations which we will assume are in fact interstate commerce corporations. On the other hand, it will be very dangerous for Congress to define them by any such phrase as 'manufacturing goods which are in fact sold in different States.' In fact, any definition will be dangerous. The Commission will easily see that if a general act is passed by Congress, an act in general terms for the organization of interstate commerce corporations, and a corporation has organized under it, and goes ahead for a few years under it, and can prove that it is an interstate commerce corporation, then, in view of that fact, the courts are very unlikely to say that it is not an interstate commerce corporation, which has in fact been chartered as such and acting as such for many years; so that that comes to the same conclusion. After trying for two or three months to make definitions of interstate commerce, after collecting all the definitions I could find made by the Supreme Court and by the circuit courts of this country, I finally, contrary to my first impression, dropped the whole business. In other words, if Congress should desire to enact such a law, or you should recommend it, I do not think it would be wise for Congress to attempt to define what interstate commerce is. I think that, in fact, as we have just said, if such a law were passed, and corporations were to organize under it and act for many years—because it would be several years, of course—and if everybody knew it, and it was a matter which the Supreme Court would almost take judicial cognizance of, that these

corporations were almost entirely doing interstate business, the court would so hold. Take the case of a corporation, for instance, that mines coal in a State where it sells no coal, if such a thing is possible—and it is possible—but all necessarily goes outside of the State. It is organized under articles which state that it is organized for doing interstate commerce, and it has in fact been going on for years, and the corporation wants it to be so held and will furnish evidence that it is doing it. I do not think there is much danger that the Supreme Court will hold that the act of Congress does not apply to such a corporation; whereas if you attempt to define you are met at once by the decisions that I have quoted; you are met at once by a decision the Supreme Court has given that manufacture is not interstate commerce, and all those rocks lie in the way. In the second place, if you define, you meet a very great objection to begin with, because both Congress, when the law is being debated as a bill, and afterward the courts, will be met on the threshold with a statement of what is interstate commerce, which they may demur to. You put the objection right in front, instead of waiting to see whether you reach it or not, and you lose the elasticity of the Supreme Court itself, which, as we know, is very ready to apply what we call the 'implied powers' of the Constitution in such a way as to further what seems to it to be the necessary course of events and business of this country. They will define for you far better than you can yourself. And, finally, any definition narrows the scope of the bill. The moment you say 'a corporation to do thus and so,' the lawyer on the other side, when the case comes up, will argue that because you say that, you do not mean the other thing; if you say transportation, you do not mean manufacture; if you say manufacture, he will say that this has been decided already not to be interstate commerce."

A Permissive, Not Mandatory, Statute.

Referring to the proposed statute chartering Federal corporations Mr. Stimson urged that, at the outset at least, the law should be made permissive rather than mandatory, and on this point he said:

"The last part of this proposed first section leads to the next recommendation I shall certainly make the Commission. That is, even if this be done at all, it does not seem to me wise, and I have no doubt the Commission already think so, to make this a mandatory statute; that is, to provide that any corporation or persons doing this business must organize under the Federal statute. Such a law would be, in the first place, altogether impossible of any practical acceptance, I think now, at the hands of the people in their present temper; it is doubtful if it would go through Congress; and it is really too sudden; it is too radical. On the other hand, if you make this a permissive statute, it becomes at once, in a sense, experimental; you neutralize an immense amount of opposition. Those corporations only will come in which most undoubtedly belong to the class intended, and which, from the very fact that they come in voluntarily, will be desirous of making the law a success and will work fairly under the statute proposed."

As to the measure of control that a permissive statute would provide for those corporations that would apply for charters thereunder, Mr. Stimson said that it would be very comprehensive, but, combined with a very low rate of tax, the right to sue and be sued in the Federal courts would constitute a very strong inducement. Continuing, he said:

"If, therefore, these inducements are sufficient, as I think they are, to get these great combinations to come in under the law, and if, as I believe, the courts would hold that when they said they were organized and were doing an interstate business, and when in fact they manufactured and sold and exchanged in more than one State, and made contracts in more than one State, the law would apply and hold to these corporations, you would at once have the national bureau of reports and of taxation, which, as it collected the taxes, would require all the reports which were needed about these companies. Every kind of information would be given that Congress chose to say it wanted; any kind of regulation could be put on, without any exception, that

Congress chose to put on. Even the fourteenth amendment would not apply, because these corporations, being created by Congress, could be destroyed by Congress. It would even be possible to so regulate these corporations as to prevent them from underselling in certain localities in order to drive out competition. There is nothing Congress might not do, subject only to the danger of driving the corporations to relinquish their Federal charters. Congress would have the full regulation of them, and it would be an object lesson. We should hope that most of the large corporations now created by the States which in fact do an interstate business would choose to come under this law and take out a Federal charter."

After testing a permissive statute, Mr. Stimson said the next step would be to make it mandatory.

"Finally," said he, "after experience and success with the legislation, it would be a fair subject of consideration then for Congress to make the law mandatory. In other words, if it had created a means by which corporations could well and satisfactorily do this immense business in the country that is now done by these large corporations, and many of the combinations that came in and stayed in showed that they could do so, and it went along all right, it would then be practical politics and reasonable, and would not arouse opposition at that time, for Congress to pass another law providing that no State corporation should in the future do an interstate commerce business, but that all such business should be conducted by these Federal corporations. That, I am quite sure, is the way to get at it. As a lawyer in New York who is largely engaged in these matters expressed it to me, the thing to do is to 'toll them in' first. When you have got them in and have got them organized under the Federal law, regulated and improved so that you will not drive them out, and the thing goes on until you have a recognized successful system, then, if you will you may require that all this interstate commerce business be conducted by Federal corporations, if by corporations at all."

"I think that such a law would be constitutional. I think that in so far as I have now gone in the statement it would work; that is, that a permissive law of this sort would work with the bureau to be established, which should be the organism, in the first place, to grant charters, and, in the second place, to direct the operation of them, and, in the third place, to tax such corporations."

The idea of a bureau such as is suggested by Mr. Stimson has been adopted by a majority of the Commission, but only so far as it would have control of the taxing of corporations and of securing publicity for their operations by means of reports, &c. The Federal charter feature is strongly advocated by several members of the Commission, and an effort is being made to bring the majority to the same way of thinking before the Commission's report goes to Congress. W. L. C.

Anthracite Coal Trade of 1901.

The Philadelphia *Ledger* of December 30 sums up a review of the anthracite coal trade of 1901 as follows: The anthracite coal year of 1901 is practically completed, and the estimated tonnage mined and sent to market makes it the banner year for this great industry. The estimate is that about 53,500,000 tons have been produced for 1901, which is an increase of about 8,400,000 tons over 1900 and by far the largest annual product of the trade. Could there have been ample facilities for coal shipment and no car shortage at the mines the market would have taken a much larger output, as the demand for anthracite has exceeded the supply during the latter part of the year. Prices are unchanged, the full circular rates being obtained, and there is no indication of any advance in contemplation by the producing companies.

The manufacturing establishments of Tennessee, according to a bulletin issued by the Census Bureau, increased 75 per cent. in number between 1890 and 1900, the number in the latter year being 8009. Their capital was \$71,222,680, an increase of 38 per cent.

Modern Wood Carbonizing in America and Its Future.

Interesting developments are taking place in the utilization of the by-products in the manufacture of charcoal, and some misapprehension has grown out of the fact that heavy failures have recently taken place in Germany among manufacturers of chemicals produced in wood carbonization. Based upon the assumption that the Germans are far ahead in the scientific and mechanical methods, the inference is drawn that in the United States, too, conditions must take a serious turn.

One who is closely identified with progress in the industry in this country makes the following points in a review of prevailing conditions. In the manufacture of wood alcohol, acetate of lime and tar from wood the question of a supply of raw material is of primary importance as bearing upon the cost of production. The United States is probably the possessor of the largest quantities of suitable hard wood standing timber in the world, these woods being the birch, the beech and the maple. Although the supply is rapidly decreasing, it may be safely figured that these hard woods can on an average be laid down at the carbonization works at \$2.25 per cord, cut to 10-inch face, and at \$2.50 per cord, cut to 5-inch face. The German manufacturer has the disadvantage of working with a raw material which costs him from \$5.50 to \$6.50 per cord, so that the methods of manufacture being equally good the American producer should be in a position to crowd the German manufacturer to the wall. The one fact which has told in favor of the German manufacturers is that they produce higher grades of chemicals, viz.: Benzol, tuluol, guajacol, naphthaline, creosote, &c. This is a field which the American manufacturers have not yet entered. They have confined themselves to the cruder products, and in this way the production of acetate of lime in the United States, which was a little over 5,000,000 pounds in 1880, has reached over 100,000,000 in 1901. The output of wood alcohol has developed proportionately; a large percentage of these cruder products has been exported to Germany at an average price of 1.5 cents per pound for acetate of lime. A part of the material so exported is refined in Germany and is returned to the United States as acetic acid, the quantity being 3,000,000 pounds, which is valued at 13 to 15 cents per pound. This increase in the value of the product includes the cost of freight on acetate of lime from the United States to Germany, the cost of refining, the manufacturer's profit, the return freight to the United States and the import duties. It seems safe to assume that this state of affairs cannot last very long, since there is no reason why acetic acid should not be produced in the United States, both to cover the home consumption and for export, instead of as now exporting the raw material. It is only owing to the fact that the German manufacturers produced the higher derivatives from the raw material made in the United States that they have been enabled to practically monopolize the acetic acid trade of the world.

Different methods of destructive distillation of wood are in vogue. The older method of carbonizing in beehive kilns is that exclusively used by the manufacturers of charcoal iron. By this method only 40 per cent. of the by-products is recovered, the balance being consumed in the process of distillation. An idea of the waste of material which this involves may be obtained when the fact is taken into consideration that there were produced in the United States in 1901 about 350,000 tons of charcoal pig iron. Figuring on the basis of 2 cords of wood per ton of iron there were carbonized 700,000 cords of wood, from which there might be recovered profits aggregating over \$1,000,000, on the basis of an average net profit of 20 cents per gallon on wood alcohol and ½ cent per pound on acetate of lime.

Those who have been using the older and cruder methods of wood carbonization are alive to the fact that something must be done to place them in a better position to compete with coke iron. They naturally turn

to the saving of the by-products from their charcoal plants for their salvation. It is clear, therefore, that the manufacturers of charcoal pig iron must give increasing attention to this subject, and that their competition is likely to prove a disturbing element to the manufacturers of wood alcohol and acetate of lime, who conduct the recovery of by-products as their principal business. These producers, who are almost exclusively located in Pennsylvania, employ the retort process. The method consists in carbonizing in an iron chamber by the application of heat from the exterior. By a process of evolution the size of these retorts has increased from a capacity of 1000 pounds until it has now reached a capacity of 5 cords, which appears to be the limit of carbonizing with the application of exterior heat.

Recently a new retort process has been brought forward under the name of the "Economic" process, which is being introduced in the largest charcoal iron furnace in the United States, the installation having a daily capacity of 300 cords. This process provides for the introduction of non-combustible gas directly into the retort without bringing about combustion. In this way the contraction and expansion characteristic of the present retort plant is avoided and an increase in their capacity is made possible from 5 to 30 cords. The charring is done on special cars built by the Pressed Steel Car Company of Pittsburgh, and in this way the manufacturer is enabled to haul his wood on these cars from the forest and carbonize it without unloading and reloading at the rate of two cars in one retort. Thus a large saving in the handling of the raw material is effected. Besides this there is a considerable saving of the heat by applying it directly into the retort in the place of exterior firing, as has been done heretofore. The manufacture of wood alcohol and acetate of lime will, as the result of this new process, show a tendency to slip away from the hands of the small manufacturers, whose chief business it is, into the control of the charcoal iron manufacturer, who simply utilizes a waste product.

A further source of wood alcohol and other by-products promises to develop in the lumber trade. There the waste which is now burned may be treated by the "Economic" process in carbonizers, from which the gases are taken off to suitable condensers. The larger lumber concerns will therefore become producers of wood alcohol and acetate of lime, the charcoal made being mixed with tar as a preliminary to the manufacture of briquettes.

It may be of interest to note that a strong effort is being made in Canada, Ireland and Scotland to utilize the extensive peat deposits for the production of a fuel for metallurgical purposes. It is estimated that 4600 pounds of compressed peat can be made to yield 1400 to 1600 pounds of peat coke, 240 pounds of tar, 12,000 cubic feet of gas, 5 gallons of 95 per cent. wood alcohol, 100 pounds of acetate of lime and 80 pounds of sulphate of ammonia.

From a cord of hardwood there can be obtained 1000 pounds of charcoal, 9 to 10 gallons of 95 per cent. wood alcohol, 2000 pounds acetate of lime, 280 pounds of tar and 12,000 cubic feet of gas. It is reported that strong capitalists are interested in the exploitation of peat for metallurgical purposes.

The impression has been created that serious competition is threatened from Canada. Aside from the fact that the American market is closed by a tariff, it seems that the cost of production of wood alcohol and acetate of lime in Canada will be so high that it is not likely to cut any serious figure in the export trade. This statement is based on the fact that the Canadian wood lands are inaccessible and that there is a lack of transportation facilities and of suitable labor, that the timber is stunted and twisted, and that as large a percentage of by-products cannot be obtained from wood grown on a granite formation as can be secured from wood grown on a limestone formation. It is stated that American producers can well afford to pay \$5 per acre for wood land, and yet on a basis of cutting 30 cords per acre they can obtain hard wood \$1 per cord cheaper than competitors in Canada working on Government grants.

The Iron Age

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The Protracted Activity in the Iron Trade.

The iron trade is now entering upon its fifth year of activity. It will be remembered that, when the revival in the demand for iron and steel began to make itself felt in 1898, some exceedingly sanguine members of the trade quite confidently predicted that the country was destined to see at least five years of prosperous conditions. Their roseate view of the future was received with considerable skepticism. The trade had grown accustomed, by quite a train of peculiar experiences, to believe that no betterment in demand and prices could possibly be of a protracted character. It was assumed that our capacity for production could be so easily expanded whenever necessary that if at any time an excessive demand would spring up the supply would overtake the demand so speedily that the trade would soon relapse into its condition of unsatisfactory returns to those engaged in iron and steel production.

Looking back over the immediate past, it is now plainly seen that the most optimistic views entertained in 1898 have been fully verified. These five years have been an eventful period, inasmuch as it has covered a foreign war, the development of a great export trade in iron and steel and other manufactured products, a boom and its collapse, some serious strikes, the assassination of a President, the failure of crops in some important agricultural sections, and occasional disturbances in the stock market, which, for a time, caused considerable apprehension. It appears now that the foundations for a long term of prosperity were very deeply laid and very broadly built during the severe depression from 1893 to 1897. During that time of privations and struggles for existence the manufacturers of the United States were taught more valuable lessons in economical management and in the introduction and application of cost saving appliances than they had ever before learned. The establishments which were able to pass through that trying period and find themselves at its close in perfectly solvent condition, with well equipped plants, and perhaps with command of supplies of raw materials, were in a position to take instant advantage of improved times and to greatly increase their strategic position. The opportunity was also grasped for the formation of large organizations, projected by far seeing men who only needed the backing of capital to enable them to make combinations which they realized would have an enormous advantage in conducting manufacturing operations. Out of these circumstances grew the tremendous advance made by the manufacturing interests of this country during the past five years.

During the period thus under review experienced business men have almost invariably been moved to exercise extreme caution whenever an occurrence of an adverse character has happened. They have permitted their experience under previous conditions to lead them to believe that every check to business activity marked the beginning of a protracted downward course of prices. On no less than three occasions in the past three years have wise men of the iron trade been thus de-

ceived. To the surprise of the majority, the year just ended has passed out under conditions marking the greatest activity yet known. It had been expected that by this time the iron trade would surely be on its downward course. The great falling off in iron and steel exports during the year was one of the influences which it was felt would lead to overproduction if the iron trade should again be obliged to depend solely on domestic markets. The growth of domestic consumption to such a point as to require not only every pound of pig iron and steel produced in this country, but also some foreign material, is a most surprising development. It is one of the marvels of the times. All the increase in capacity during the year has not been sufficient to cause any disturbance in the markets except in the wire trade alone, and in this trade the volume of business has been so large that no serious results have followed from the increasing competition, the recession in prices having been gradual instead of abrupt. It may be said, therefore, that in every line prosperity and full employment continue to be the rule.

The question uppermost in every mind is, How long will this condition of affairs last? From present appearances it will continue until some financial upheaval again destroys confidence, production overtakes consumption, or farming interests suffer from some greater calamity than that of last year.

There is a feeling in financial circles that a very large volume of new issues has been placed on a market whose power of absorption, wonderful as it is, has been greatly taxed. While a good deal of capital has merely shifted, an enormous amount has been put into undertakings which cannot very well be immediately productive. Speculation has suffered some defeats, notably through the pricking of the copper bubble, and there has been some uneasiness in other lines, but on the whole the situation is regarded as essentially very sound.

On the question of a possible early oversupply in the iron and steel trades all doubts are now at rest, at least so far as the first half of 1902 is concerned. In fact, the problem of the moment is rather how to satisfy legitimate demands, there being absolutely no speculation. Our annual reviews, printed elsewhere, deal in detail with the amount of work under way to provide for further expansion of product. There is hardly a concern of any importance in the country which is not enlarging and improving, and there has been some very remarkable work in progress in bringing the plants of the great steel corporation to a higher standard of efficiency. A good many more independent concerns, large and small, have been started, so that not only is the capacity enlarging, but it is also greatly improved in character. In other words, we shall be able to make in 1902 more iron and steel, and cheaper iron and steel, than we ever have done.

Prices, while undoubtedly remunerative, are not so high as to check consumption at home, although they are altogether, for the time being, above the world's level of values. Of course the time will come when we must again seek foreign markets, and then we shall have to be content with much lower returns. But we shall then be very much better equipped to secure a large share of the world's markets. The best opinion in the American iron trade is that this test of strength will not come in 1902.

Nor must it be forgotten that every addition of modern plant in the iron and steel industries in this country, every one of the notable reductions in cost now being achieved, means the displacement of capacity now active in foreign countries. A group of great new fur-

naces in the Central West, a new steel plant on the Lakes, means that some toddling old furnace in the Black Country, some old puddle mill on the Continent, will soon be forced out of the business. There is a tremendous amount of antiquated manufacturing capacity ready to wander to the scrap heap. Our expansion means more now than it did when we were fighting for our home markets alone. It means that business long held abroad by those who are decrepit and superannuated must go to the new plants of the United States. We have an enormous amount of work before us and need not be frightened because we cannot see an outlet for our products at our immediate doors.

Small National Banks.

Some features of the last report of the Comptroller of the Currency are worthy of special consideration; full of interest and of weighty import.

The returns to the Comptroller reflect the general business prosperity; the confidence engendered in financial circles by the gold standard law, which went into effect on March 14, 1900; the increased preference given to the national over the State system of banking, and the popularity of banks of small capital—under \$50,000, the gold standard law permitting the establishment of such institutions in the United States for the first time. Another point to note, however, is the apparent reluctance of the banks, great and small, to issue notes to the extent authorized by law based upon the bonds deposited.

During the period between the enactment of the gold standard law—November 14, 1900—and November 30, 1901, there was a net increase of 692 in the number of national banks chartered. The total number of charters granted was 774 up to November 30, ten more were issued up to the middle of December, and there are now on file in the Comptroller's office 100 approved applications for charters, this making a total of 884. But the net total is only 802, some banks having gone into voluntary liquidation, some having passed into the hands of receivers, and others having been eliminated by consolidation with other national banks. The latter process has been responsible for the reduction of active charters to a considerable extent, especially at New York, Boston and other large business centers.

Interest centers especially in the relatively large number of new banks having an authorized capital under \$50,000 each. Banks of this character form about two-thirds of the total of new institutions, but having an aggregate capital less than one-third of the total amount authorized.

It is of significance that the Middle States have been the most active in the formation of new institutions, Iowa leading, with 43 small and 13 large banks; Ohio second, with 27 small and 18 large; Illinois third, with 32 small and 11 large, and so on.

It is especially gratifying to note the growth in the South, where 189 new banks have begun business under the national system, 119 institutions having capital under \$50,000 each, and 70 banks with capital stock over \$50,000 each. Texas has been most conspicuous in the activity in banking, having 96 of the new institutions established. Two successive good cotton crops and animation in the oil fields have doubtless stimulated the growth of these financial ventures.

Among Eastern States Pennsylvania has led with 83 new banks, and New York is second, with 29 new national institutions. Of the Western States California has shown most growth, her banking facilities having

been increased by 12 new banks. New England has gained 12 new banks, all told.

There are 518 new banks each having a capital of less than \$50,000, the aggregate being \$13,559,500, while there are 256 institutions each having over \$50,000 capital stock, aggregating \$29,035,000.

That the larger banks were not founded to secure the benefits of circulation, which were increased by the new law, is evident from the small percentage of circulating notes which they have issued. The bonds deposited to secure circulation by the smaller banks—\$4,731,600 par value—were a little more than one-third of the aggregate capital stock, but with the larger institutions the bonds deposited—\$6,872,500 par value—were considerably less than 25 per cent. of the capital. It would seem that both classes of banks went little beyond the minimum of the bond deposits required by law, anticipating little profit from the employment of circulating notes. Indeed the new banks deposited only \$11,604,100 bonds to secure circulation, indicating that most of the increase in bond deposits—about \$83,000,000—was made by the banks already in business when the new banks were chartered.

One of the most healthful signs during the period indicated was the change of 108 banks, with a total capital of \$8,240,000, from the State to the national system, being over 20 per cent. of the new national banking capital.

The total number of active national banks on November 30, 1901, was 4309, having an authorized capital of \$607,834,195; bonds deposited, \$328,107,480; circulation, bonds, \$326,212,186; circulation, lawful money, \$38,508,525. This shows a net increase of over \$50,000,000 in capital, and \$83,000,000 in circulation, as compared with the statement made on March 14, 1900, when the gold standard law became operative.

The Railroads and Freights.

An instructive and temperate report of the Committee on Railroads and Transportation of the Pittsburgh Chamber of Commerce has been issued, made under the instructions from that body to investigate the causes of the freight congestion of the past few weeks, and especially to ascertain whether there was warrant for the charge that Pittsburgh was being discriminated against in the matter of freight handling facilities. The disposition to blame the railroads for lack of enterprise in not providing for the conditions existing at the moment would seem to be a little unfair, in view of the fact that the change in conditions has come very suddenly and at a time when public confidence in the value of car trust certificates was somewhat rudely shaken by the predictions that the railroads would suffer severely from the partial failure of the corn crop. It will be remembered that during August and September the crop estimates were made the basis of a persistent bear attack upon railroad securities, and it was confidently predicted that owing to a shortage of 1,300,000,000 bushels of corn, more or less, the eastward movement of freight would be so curtailed as to materially affect railroad earnings. The question was not how the railroads would move the freights, but where they would find business enough to employ their capacity. This question has answered itself in a most unexpected way. How it would have been answered if the corn crop had been a full one is an interesting subject of speculation. That the conditions would have been a great deal worse than they now are, and the relief even more remote than it now appears to be, will probably be conceded without argument.

In determining to what extent the railroads are blameworthy for lack of enterprise in failing to foresee and

provide for the conditions existing at the moment, it should be remembered that until about a year and a half ago railroad management was not all "beer and skittles." Many of the lines had great difficulty in making net earnings cover fixed charges, and not in every case were they able to do it. It is a grave question whether the conditions existing even a year ago would have warranted the railroad managers in showing any greater enterprise than they manifested in making anticipatory provision for the increased activity in general business than the facts show that they did. They are neither seers nor prophets, but they have reasonably good memories and are duly sensible of the fact that they have to make annual accountings to their stockholders.

The case of Pittsburgh at the moment is a typical one. Its railroads are congested and its industries are suffering. It is a freight center of first importance, and its business interests are represented by men who naturally think that their legitimate requirements should be studied by the railroads and amply provided for. None of these propositions will be disputed, but how was it only recently, so recently, indeed, that the railroads may be forgiven if the facts had some influence in shaping their policies? In a recent issue the *Railroad Gazette* put the facts very clearly, as follows:

"It must be remembered that for a period of four years, which was ending but three years ago, the industries of the Pittsburgh district (and the rest of the country) were prostrate. In that city, through the effort of organized charity, employment was given to thousands of men whose services were not required in the mills and mines, and empty freight cars by the thousand stood idle on the side tracks. The problem that then confronted the railroad managers was to give employment to the nucleus of a disciplined force and at the same time to end the year without a debit balance. At that time newspapers and public men were voicing the opinion that manufacturing in this country had been overdone; that domestic consumption could not overtake the capacity for production for a decade if not for a generation to come; that the "pauper labor" of Europe not only smothered the thought of the disposition of a surplus abroad, but awakened the fear of our further suffocation by the importation of foreign products. In his rejoinder to Mr. Frick, in their noted controversy, Mr. Carnegie reminded him that he (Carnegie) alone of all the officers of the Carnegie Steel Company had in 1895 expressed confidence in the future supremacy of Pittsburgh as a steel center and had acted accordingly, it having been an often mooted question whether the proximity of Pittsburgh to coal was sufficient to overbalance the long haul of the ore and the flux. Had the directors of a Pittsburgh railroad been told, along in 1897, that within four years there would come a time when double the track (miles of which was then useless), when double the cars (thousands of which were then idle), when double the locomotives (hundreds of which were then dead in round-houses) would be all inadequate to handle the business that would offer, the informant would have been regarded as crazy. Yet that is exactly what has happened in the last two months."

To the disinterested student of the situation it looks very much as if the railroads had done the best they could to meet the situation now existing, and that sound business considerations would not have justified them in making provision for a condition of affairs which could not have been anticipated. They have kept the locomotive shops crowded to the breaking point and have built in their own works as many engines as they had room for. Certainly the railroads are putting their earnings into improvements and new rolling stock as fast

as they can, and had they done it on the same, or even an approximate, scale of liberality two years ago, their securities would have been "unloaded" by every conservative investor in this country and Europe. In point of fact they had then neither the money nor the credit for such increase of equipment, and up to within a very few weeks the flotation of car trust certificates has been none too easy, as the corn crop scare made investors shy of such securities.

The obligations imposed upon the railroads as common carriers do not require them to perform miracles. It is also a question whether it requires them to be more provident in the matter of new rolling stock than the trustees of these great properties could justify on sound business considerations. That the conditions existing at the moment are deplorable, and that they entail great loss and greater inconvenience to manufacturers, dealers and consumers in nearly all lines of business, is undoubtedly true. But that the railroads are doing all in their power to provide the remedy is also true, and it is difficult to discover good grounds for the belief that they have been negligent in looking after their own interests, which were also the interests of the shipper of freights. The strength of the steel situation is undoubtedly due in great degree to the enormous purchases of the railroads for equipment and supplies, and with the new rolling stock in use and in sight the most important question now confronting the railroads would appear to be how to provide increased terminal facilities.

The Copper Situation.

The copper trade is still unsettled by the conflicting reports as to low prices made for the metal and by the predictions freely circulated as to further declines. We hear a good deal of the punishment to be inflicted upon recalcitrant outside interests among the copper producers. All this has a very disastrous effect upon the great mass of consumers of the metal and is delaying a return to a sound condition in many important collateral industries.

It has been the fashion to compare the recent events in the copper trade with the famous Secretan corner, and to draw the deduction that the metal must drop indefinitely until the accumulated surplus is worked off and production has been cut down very materially.

Now the fact is that the high prices during 1899 were not due to any cornering operations. The consumption of copper had expanded in the years 1898 and 1899 until the production was utterly incapable of meeting the supply. The metal had been for many months above the 17-cent mark before the Amalgamated Copper Company were organized. The flotation of that concern was rendered possible by the extraordinary strength of the copper market, and conditions justified the prices secured even after that blind pool consolidation had been effected. The trouble was that those who managed the Amalgamated Copper Company either failed to observe or did not want to see that conditions underwent a change. The decline in the consumption of Europe and of Germany in particular was very quickly noted by every one interested in the metal. But we were told by the sufferers themselves that the crisis in Germany and elsewhere was only a passing phase and that the enormous consumption in our own country would probably more than offset the falling off of the European requirements.

We were told that copper was accumulating in the hands of the Amalgamated Copper Company because business conditions had changed, that the day was past when manufacturers would or could be expected to carry

any stock, and that since it is the producer who must have the reserve supplies, copper became visible which formerly would have been invisible; in other words, that the stock was really not as great as it might appear, being massed in the hands of one party. Now it is only fair to state that there is something in this argument, and the trouble seems to have arisen chiefly because other large producers were not willing to bear their share of the burden.

If the price of the metal is to be determined by the desire on the part of the contending interests to inflict upon one another the maximum amount of injury, then there is no telling what figures will be reached, and we may well see a repetition of the prices of 1894, when lake copper sold down to 9 cents a pound.

It is argued that the low cost of production of the leading American copper mines justifies the belief that the metal may again sell at the figure then reached. The point is made that since then improvements in mining and in metallurgy have even lowered the cost, although as an offset to this it should be noted that the mines are deeper and the ores, notably of Montana, are much leaner. At the present time costs generally are high, because labor is very well paid. This, of course, must come down with the price of the metal, but it is well understood that this is a slow process and that in the case of the position of the Miners' Union in Butte it is one of very serious danger.

It seems, however, that the true aspect of the copper situation, on its merits, must be judged from the standpoint of the consumption. The day of abnormal prices, really justified for a while by the enormous demand, is over. Will the requirements for the metal expand to a more normal volume now that prices have become reasonable? So far as this country is concerned, that question may be answered in the affirmative, and it seems safe to state, by way of inference from the wonderful prosperity which we are now enjoying, that even the recent tremendous consumption may be added to.

It is when we turn to Europe that we encounter doubt. The depression in the electrical industries on the Continent is only too real, and the financial situation is such that we can only hope for slow recovery. Still, there are elements of encouragement, notably in Great Britain, which must not be overlooked. Then there must be taken into account the fact that the mushroom copper mining enterprises, unimportant individually, but of some magnitude in the aggregate, will be swept out of existence, and that thus the supply will be somewhat lessened. While fairly profitable to the great mines of the world, the present level of values is destructive to many enterprises in their present early stages. An impartial review of the situation seems to justify the conclusion that with a reawakened consumption copper is pretty close to a sound basis.

J. J. Ryan & Co., brass founders and finishers, 68 to 74 West Monroe street, Chicago, Ill., have recently signed a contract with a large Eastern concern to remelt all their old nickel, which they purchased from time to time from their trade in exchange for new nickel. The firm in question were so pleased with the work done by Ryan & Co. on their sample orders that the contract was signed for all the West, Southwest and Middle States for a period of three years. Since closing this contract Ryan & Co. found it necessary to add 5000 square feet more to their foundry space. This makes the eleventh time in the history of this firm where they found themselves compelled to add to their capacity to keep pace with their orders. Seventeen years ago they occupied a space of less than 3000 feet, to-day the foundry alone comprises 26,000 feet, certainly a remarkable career.

CORRESPONDENCE.

The Decadence of the Cast Iron Car Wheel.

To the Editor: Officials of the mechanical departments of some of our leading railroad companies are discussing the necessity of the betterment of the chilled cast iron car wheel, with a view of having it meet the universal demand for a more reliable and perfect one than they are receiving from the manufacturers at the present time. If a more satisfactory cast wheel cannot be produced, they tell us plainly that they intend to substitute a steel wheel for all heavy service, even should the first cost be much greater. Some of these debates have found their way into the columns of the technical journals. From them and other private sources we gather enough to recognize the necessity and propriety of an honest criticism from railroad men, who are seeking the highest efficiency in their wheel service, to meet the existing wants and new conditions which are brought forward by increasing the capacity of their freight cars.

It is claimed that the present car wheel fails to satisfy all the requirements, and that it has neither the life, strength or endurance to give general satisfaction when placed under a car of 80,000 pounds capacity. The pictured perfection sought by some of these individuals is thought to be within hand grasp, but they do not even dream of the reasonableness of the wheel maker's side of the question, their ideas of right and wrong seem to conflict. When both sides find fault you have probably meted out justice.

It is further claimed that the car wheel of to-day is not as reliable as it was in former years, and that it has been and is still slowly degenerating year after year. If it be true that the present cast wheel is gradually passing away from its once strong, reliable and perfect state to a less perfect one, there must be some good and a sufficient cause for its present unsatisfactory condition. It is plain that "what does not advance, recedes." Therefore, it is true, that if there is a gradual decadence, the fault should be pointed out and remedy for its betterment at once suggested, to bring it back in the best practical manner to its former standard of excellence so that it will meet the present universal demand for a better and a longer lived wheel.

The wheel manufacturer claims that railroad companies are not paying a satisfactory price for a good, reliable and substantial wheel made strictly in accordance with the latest and best perfected methods known to them, and that they are compelled by their agreement with railroads to remelt a large per cent. of the scrap wheels as they receive them and cast the same material into new ones to meet competition.

Old wheels are quoted at \$17 per ton and the new product is being bought for \$22 per ton, the manufacturer receiving about \$1.50 per wheel in cash for each new wheel turned out—providing, however, that it meets all requirements expected from a first-class wheel made from the best material and in a workmanlike manner.

The railroad purchasing agent tells us that he is continually entreated by the manufacturers' salesmen to buy their cheap wheel, which will answer all purposes and give general satisfaction. These salesmen are always willing and ready to give the manufacturers' guarantee that his wheels will fill all requirements, and that he will furnish without any additional expense to the railroad company a new replacement wheel for every one of his make which fails to make the guaranteed mileage in any service they are placed, and is willing to take back an equal weight of scrap wheels for the new ones he furnishes.

It is a well established practice among railroad companies when letting out their yearly contract for new wheels to distinctly specify that the manufacturer will be obliged to take in part payment an equal weight of old scrap wheels for all new ones furnished. It is further demanded that the maker must give a guarantee of five years or less with each wheel, and that all new wheels must be subjected to meet several test requirements, which is not necessary to mention at this time.

Railroad companies who are seeking the highest efficiency in their equipment should not compel the producer to take back other makers' products, but they

should insist and demand from each and every maker that they must only use a small per cent. of old wheels and only the highest grades of pig iron, low in sulphur and phosphorus, and that the different grades should be well and thoroughly mixed in accordance with the latest and best perfected methods of modern foundry practice, and that no new wheel should be regarded as satisfactory in which the phosphorus showed above 0.325 per cent., and in which the sulphur in no case be allowed to run over 0.070 per cent.; above this it hardens and makes the wheel brittle and rotten.

A new wheel when the depth of the chill is controlled by these two elements will not make satisfactory mileage, neither is it a wheel safe or reliable at all times. A first-class wheel if carefully made is not necessarily high in sulphur. But after it has made its mileage on the road and has been returned to be again remelted with other makers' high sulphur wheels, it may pick up enough sulphur to destroy its usefulness, because the sulphur generally increases with each remelting even in the best conducted cupola practice. This continual interchange and remelting of old wheels must increase the sulphur. It is little less than a crime to keep on converting old wheels into new ones without adding a proper proportion of new iron or without providing any definite safeguards as to chemical composition.

Railroad companies are furnishing the wheel maker with 100 per cent. of old condemned wheels to make their new ones from. These scrap wheels represent a wheel from every Tom, Dick and Harry's make, which were doubtless bought cheap and as a natural consequence failed to make their guaranteed mileage because of a faulty chemical composition.

We will ask the consumer if he thinks it is exactly right and just to compel one producer to take back another's product and expect him to put new life, strength and durability into this material which never had any good qualities, having failed to satisfy the requirements it was bought for or intended to fill. By continuously remelting old wheels in a cupola month after month and year after year, the product must gradually degenerate by the absorption of sulphur from the fuel and other natural causes, until some of them at present are saturated with this element and ought no longer be remelted.

A certain amount of self-sustained assurance is manifested among wheel makers with an established reputation that they can produce a longer lived and a more reliable wheel than they are at present making, if they were paid a fair price for their product and allowed to use their own judgment in selecting a suitable pig iron in open market to make them from. It must not be understood that these remarks are intended to cast any discredit on the present car wheel, which must be produced cheaply and under well-known restrictions. The wheel maker knows how to get results, but is controlled by other circumstances over which he has no control. Every practical wheel maker knows that high sulphur and high phosphorus make a hard, brittle and weak iron, and when the depth of chill is controlled by these two elements its life and strength are gone. High sulphur and high phosphorus may be two very desirable elements in some castings, but not in car wheels.

Experience is valuable in most places, and especially at the drop where all scrap wheels are broken and carefully graded by fracture. A handful of common sense around this place is often worth a bushel of learning. A practiced eye can readily detect all high sulphur chilled wheels from those chilled by low silicon. After a critical inspection of the chill plates and other well-known imperfections which led to rejection, the sulphur contents can be readily told within a few points.

The writer has made a practice for several years to select a piece of a high sulphur test broken wheel with the maker's name on it, and showing the defects that this element causes after the wheel has been in service a short time, until he has quite a collection of pieces from all makers with an established reputation. After having a careful analysis made from each piece it is retained for future reference, just to show that the best brewers sometimes make bad beer, and that the only way to make good wheels is to make no bad ones.

The writer was furnished by a railroad official shortly

after a lamentable accident occurred on his road with the following two complete analyses and with a piece of the wheel which broke under a passenger coach while the train was running at a high rate of speed.

The analyses were furnished by two of the most expert railroad chemists in the country, whom we will call No. 1 and No. 2:

Analysis.	No. 1.	No. 2.
Total carbon.....	3.73	3.72
Graphitic carbon.....	2.63	2.59
Combined carbon.....	1.10	1.13
Manganese.....	0.37	0.35
Phosphorus.....	0.366	0.361
Silicon.....	0.72	0.72
Sulphur.....	0.169	0.172

A prominent railroad some time ago allowed to be published in the trade papers the analyses of several wheels selected from the principal wheel makers in the country.

As authority has considerable weight with some minds, we will give three analyses as published at the time:

Analysis.	No. 1.	No. 2.	No. 3.
Total Carbon.....	3.65	3.72	3.68
Graphite carbon.....	2.41	3.08	2.54
Combined carbon.....	1.24	0.64	1.14
Manganese.....	0.31	0.32	0.19
Phosphorus.....	0.53	0.42	0.39
Silicon.....	0.57	0.47	0.88
Sulphur.....	0.16	0.16	0.16

WM. FAWCETT.

ST. CHARLES, Mo., December 23, 1901.

The Iron Mines of Southeastern New York.

To the Editor: It may seem foolish to call attention at this time to an iron ore bearing district which has been known and worked for more than 170 years, but the changes which have, and are taking place, in the iron business have made one wonder what would come next. The time, therefore, may not be far distant when the region whose ores were among the first to be worked into articles useful to man, may again be a factor in the supply of the most useful of metals. On the east of the Hudson we have the brown hematite ores, which made it possible for this country to produce cast iron car wheels, unexcelled by any other region. A combination of this brown hematite with the magnetic ores was what made the supremacy of this country in foundry iron and rendered it possible to make iron castings that could not be equalled in the old world.

The use of modern machinery and the discovery of the large bodies of high grade ores in the Lake Superior regions compelled the old fashioned small iron works in the East to drop out of the race, but the time is coming, and may now be nearer than we think, when these bodies of ore, so long lying idle, will once more be of use and will add their product to the world's supply.

The brown hematite mines of southeastern New York are in two belts. The first is known as the Fishkill-Clove belt, and stretches northeast from the Highlands of the Hudson to Beekman and Unionville. The second belt traverses the valley known as the Harlem, from the Highlands across Dutchess County to Hillsdale, in Columbia County.

On the Fishkill-Clove belt the largest deposits is known as Clove-Spring. It is a very large body of brown hematite ore, but is about 3 miles from the railroad. This fact has retarded the development of this property, as the cost of transportation by wagon was too excessive for an ore of this quality.

In the Harlem valley the Sharon mine, at Sharon Station, lying in the valley, is known to be a very large deposit of brown hematite and nearly low enough in phosphorus to be classed as a Bessemer ore. A few miles above this, in the same valley, is what is known as the Amenia deposit. This is also a very large deposit of brown ore, interspersed with carbonate of iron. A few miles further on is located what is known as the Maltby mine, whose ore has been largely used in the production of car wheel iron. Near the Maltby and just across the State line in Connecticut, is the Ore Hill mine, known and worked for nearly 170 years. It is still a large and regular producer of brown hematite, which is used in making iron for car wheels. There are numer-

ous other deposits in this region, nearly all of the large ones being between the slate rock and the limestone.

While some of these mines have been worked to a depth of 150 feet, none of them show any signs of exhaustion. Excepting the Ore Hill mine, work in this region has been almost exclusively done by what is known as open cost. There seems to be no reason why these ores, with proper machinery, should not be mined at a reasonable cost by modern methods of underground work. It has been shown to be a waste of time and money to attempt to remove the immense over burden of earth and clay. Aside from the necessity of handling so many tons of worthless material there is the danger of its becoming mixed with the ore. If this district is ever to become an iron ore producing district the work must be done by underground mining. There are no physical difficulties inherent in these mines, which would debar underground mining, as the same problems have been worked out and shown to be feasible in numerous other localities. While these ores can never be classed as cheap, the time will come most assuredly when they will become useful.

In speaking of these ores one is compelled by necessity to also mention the magnetic iron ores of Orange and Putnam counties. We have near this region of brown hematite ores a large area of country where there are numerous bodies of magnetic iron ore of varying degrees of richness, none of which are being worked at present, except the mines of the Stirling Iron Ore Company. Some of these deposits of magnetic ore are low in iron, and will require magnetic concentration. Here, then, are lying near each other at present useless, the two ores which, combined, will make an ideal foundry iron, at the present time lying useless. While it would be unsafe to say that it would be possible at present to work these ores at a profit, yet it would seem that with improved methods and machinery the difficulties which would beset the operation of these mines could all be easily overcome.

HEMATITE.

The Reorganization of the American Woodworking Machinery Company.—The American Woodworking Machinery Company have been incorporated under the laws of Pennsylvania, with \$1,500,000 authorized capital stock, as successors of the American Woodworking Machine Company, foreclosed in October last. The following plants are included in the reorganization: "Rowley & Hermance Company, Williamsport Machine Company, and Lehman Machine Company, all of Williamsport, Pa.; Levi Houston Company, Montgomery, Pa.; F. H. Clement Company, Rochester, N. Y.; C. B. Rogers & Co., Norwich, Conn.; Goodell & Waters, Philadelphia, Pa.; Milwaukee Sander Company, Green Bay, Wis., and Hoyt Plant, Aurora, Ill. Estimated value of property, including patents, tools and machinery, about \$1,000,000; products, raw and in process and finished, about \$250,000; accounts receivable, about \$250,000; bills receivable, about \$100,000; cash, about \$30,000; total, \$1,630,000." The company are arranging to mortgage their property, excepting the Lehman and the Goodell & Waters plants and a small portion of the Rogers and Houston plants (which will be dismantled, the machinery put into the other plants and the property sold) to secure \$350,000 of ten year 6 per cent. gold bonds dated January 1, 1902, free from all taxes, \$35,000 of which must be called every year at 103. Of these bonds \$151,000 will be used as collateral for a like amount of notes maturing in instalments from July 1, 1902, to January 1, 1908; \$90,000 have been, or will be, sold to liquidate liabilities of the old company and for legal and other expenses of the reorganization, making the total number of bonds presently to be issued not exceeding \$250,000, with a likelihood, it is said, of no further issue.

Expansion of the McCormick Works.—Owing to the unprecedented demand for McCormick machines the McCormick Harvesting Machine Company, Chicago, have found it necessary to erect a number of new buildings to secure the larger capacity needed to meet the increased requirements. Following are the dimensions of the more important additions made to the mammoth

works during 1901: Tempering room, 28 x 30 feet; press room, 28 x 40 feet; oil tanks, 33 x 57 feet; foundry, 54 x 288 feet, and blacksmith shop, 92 x 190 feet, all one story high; malleable works, 200 x 320 feet, two stories high; paint and packing room, 83 x 60 feet, two stories high; paint mill, 60 x 120 feet, two stories high; warehouse, 84 x 160 feet, five stories high, and twine mill addition, 150 x 200 feet, six stories high. These buildings furnish upward of 12 acres of additional floor space, which materially increases the capacity of the plant. Forty-eight acres of ground have been recently purchased for the purpose of further expanding the works. During 1901 more than 360,000 McCormick machines were made and sold, but this enormous output was insufficient to meet the demand. With the additions enumerated above the capacity of the McCormick works now is one complete machine every 20 seconds, or three machines a minute.

N. & G. Taylor Company of Philadelphia, Pa., will move their general offices early in January to the Mariner and Merchants' Building, at the corner of Third and Chestnut streets, where they are having spacious offices fitted up for their use. This change is necessary for their rapid growing business in the enlargement and development of their tin plate plant, for their trade in open hearth soft steel sheets for stamping purposes, and for their business in plate, iron and steel. Their minor offices will be transferred to their tin plate works on Tasker street, in Philadelphia, where they are already making important additions and building a very large warehouse, fully equipped with electrical elevators for the rapid handling of their product. The box department and the black plate department are also being enlarged and another story added to this building. They are also enlarging their smelting works to meet the increased demand for their fine makes of solder, &c. They have occupied the property on Branch street since 1845, and are now giving it up simply to obtain larger and more convenient accommodations.

Joseph T. Ryerson & Son, Chicago, iron merchants and special agents for manufacturers, are erecting new warehouses of heavy steel construction. These additions are necessary in order that the company may have sufficient warehouse capacity for new lines to be added, such as structural and bar steel, which will be carried in large quantities in stock. Equipment for these warehouses contemplates electric cranes, cold saws and other machinery for handling and cutting structural material to size and length. The building on Campbell avenue is arranged so that switch tracks connecting with all the trunk lines enter the building, permitting the loading and unloading of products under roof. They are greatly enlarging and improving their present five-story and basement warehouse at Milwaukee avenue, Clinton and Lake streets, Chicago, covering an area approximately 150 x 180 feet. The new warehouses on Campbell avenue will cover an area of approximately 250 feet square. All buildings complete will give the company a storage capacity of between 100,000 and 150,000 tons of iron and steel products.

United States Consul Atwell of Roubaix, France, reports that an international exposition will be held in the city of Lille between the months of May and September, 1902. It will embrace the following classes: Instruction, works of art, liberal arts, general machinery, electricity, civil engineering, transportation, wheels, automobiles, sports, agriculture, horticulture, forestry, hunting, fishing, foodstuffs, mines and metallurgy, decoration, household furniture and accessories, yarns, dress goods, clothing, varied industries, chemicals, sound economy, hygiene, colonization, material and export products, special application of alcohol as a motive force and for lighting and heating. The office of the exposition is 35 rue National, Lille.

Cables report that the long pending negotiations between Guest, Keen & Co. and Crawshaw Brothers of Methyr Tydvil have been closed. The steel works and collieries will be taken over.

The Mesaba Iron Ore Range.

It is scarcely necessary to call the attention of people interested in any branch of the iron or steel trades to the growth of the ore mining business of Lake Superior, or to the outlook for the coming year therein. But one interesting thing about the shipment of the past season is the increase of Mesaba production, and the outlook on that range is one of the topics for the future. Shipments for the years since the Mesaba became a factor in the market, with percentages of the use of that ore, are as follows:

Years.	Mesaba.	Total.	Mesaba per- centages.
1893.....	613,620	6,065,716	10
1894.....	1,793,052	7,748,312	23
1895.....	2,781,587	10,429,037	26
1896.....	2,882,079	9,934,828	29
1897.....	4,279,809	12,464,574	34
1898.....	4,613,766	14,024,673	32
1899.....	6,626,384	18,251,804	36
1900.....	7,809,535	19,121,893	41
1901.....	8,991,278	20,737,522	44

These figures of 1900 and 1901 total include the Michipicoton shipments, and an estimate of 350,000 tons all rail, which is probably somewhat low.

Of course no such increase in the Mesaba percentage has taken place without a corresponding increase in the use of those ores, so that to-day the Mesaba range, which was opened less than ten years ago, is supplying nearly one-half the ores used in the North and will very likely soon be called on for fully 50 per cent.. We may be sure it is not from choice that such percentages are used of an ore that presents serious problems to the furnaceman and whose result is not so close to its assay as those of other ranges. Careful explorations on old ranges, carried on with the ablest experience and capital, the most thorough skill that can be brought to bear, are not resulting very successfully. There have been some additions to the ore limits of the Menominee range, which still presents a favorable field for exploration, and the conditions of ore deposition on the Gogebic are better known, by means of which knowledge the formation can be more completely and thoroughly tested than before, but the Marquette and Vermillion ranges have rewarded explorers in a most unsatisfactory manner, and not at all in proportion to the money spent on them. All the year some companies have maintained explorations on the Vermillion range, and the general opinion now is that it is a region where little can be expected and where the cost of that little will be enormous.

The shipments of 1901 and of some preceding years by ranges have been as follows:

Range.	1901.	1900.	1899.	1895.	1890.
Mesaba	8,991,278	7,809,535	6,626,384	2,781,587	.....
Menominee	3,369,933	3,261,221	3,301,052	1,923,798	2,282,237
Marquette	3,121,436	3,457,522	3,757,010	2,097,838	2,993,664
Gogebic	2,868,924	2,875,295	2,795,856	2,547,976	2,847,810
Vermillion	1,785,769	1,655,820	1,771,502	1,077,838	880,014
Michipicoton	230,000	62,500	.....	.....	.....

This may seem to indicate that the Marquette range has seen and passed its zenith, though its mines are still large and of the highest importance. When the time comes, as come it ultimately must, of course, that lower grade ores than are now used will be taken, there are vast reserves of 40 per cent. ores upon the range that will be cheaply mined and are available for consumption. The Marquette range has been the leading district for so long, having shipped its first ore in 1855 and having a total to this time of 62,724,000 gross tons, that its present position, instead of pointing to the early depletion of the large region, shows still more strongly the vast stores of ore there. On every one of the five ranges south of the lake there are mines practically worked out, and on the Vermillion both the first producers, the Minnesota and Chandler, are well toward their close. But discoveries of more or less immediate importance are made on every range each year, and sometimes so close to present and long continued workings that the term, "a complete exploration," cannot yet be said to be warranted anywhere.

The Mesaba has this year shown up a very considerable tonnage of new ores, not so much perhaps as the year before, when several score million tons were shown in a single square mile, but still far more than has been shipped. Most of these explorations are incomplete,

many of them show a merchantable ore that would, a few years ago, have been regarded as fit only for road making, and there are others that present characteristics that would have been considered ruinous five years, or even three years, ago. But these are now ore and will be wanted sooner or later. There is a very elastic quality to the words merchantable ores, they mean something different now from a few years ago. It is impossible to put a figure upon the amount of ore shown up on the Mesaba range the past year, but 50,000,000 tons would perhaps not be far out of the way if the figures of explorers are taken with a reasonable allowance for shrinkage. This is aside from what may have been shown by the extension of older mines and of ore bodies that had been previously pretty well shown up. One company owning a mine on the central Mesaba that a year ago showed about 15,000,000 tons now claim to have double that amount in sight, another has risen from 8,000,000 tons to almost twice that, and other large and well-known properties have been increased in tonnage by the developments of the year. It would be idle to make any estimates of the amount of ore now in sight upon the Mesaba range, but it is probably safe to say that it is larger than any estimates that have yet been made by those in position to make a pronouncement commanding respect. There is probably no one who can say with exactness how much ore has been shown on the range, and those that have nearest to that information are not talking, either for publication or otherwise. It is very evident that explorations will continue upon that great range for some time to come, and that at all points where the formation seems to promise even a fair quality and a reasonable quantity of iron ore it will be found. Much has been done the past year in the extreme western end of the range, where the formation is wide, but the ores are apparently of lower quality than elsewhere, and the extreme east is demanding renewed attention, though previous work has been unsatisfactory. Outlying locations, considered more or less favorable by those working them, have received attention, and considerable money has been lost, and a like amount of experience has been gained, in the attempt to find merchantable bodies of ore in places where they are not. All this sort of work points not only to a great interest in iron finds but to the fact that the desirable localities are out of the market, held in very large part by the great corporation that is dominating the iron and steel market.

There are supposed to be immense quantities of iron ore in Minnesota, aside from the properties along the Mesaba and Vermillion ranges, and some work has been done in the northeastern part of the State during the year, in places where the indications were favorable. But these ores, while it may be found that they exist in quantity, are so far as known of a character that will not be marketable until the price of hematite is very much higher than now.

D. E. W.

Efforts are being made by the League for Social Service of New York City to establish a museum for the exhibition of devices and appliances for the prevention of accidents to workmen, similar to an institution of this character that has existed for some time in Amsterdam, Holland, under the name of the Museum of Security. The effect of the Amsterdam museum is said to have been to educate manufacturers and employers of labor in a practical manner as to the value and utility of adopting the various methods and appliances there exhibited, with a view to lessening danger to workmen by accident. The Dutch labor inspectors say that the museum is an excellent object lesson and that it facilitates their work in carrying into effect the necessary safeguards in manufacturing plants, as they can refer any manufacturer who does not see his way clear to providing the necessary precautions against accident, to appliances exhibited in the museum that will fit his case.

The Richmond works of the American Locomotive Company, at Richmond, Va., have received an order from the Pennsylvania Company for 15 H 6 A freight engines for the lines west of Pittsburgh. The Pennsylvania Company will also build in their own shops 100 engines for use on Western lines.

OBITUARY

MAJOR HENRY S. PICKANDS.

The death of Henry Sparks Pickands, which occurred at Chicago on the 17th inst., has removed from the Western iron trade one of its most widely known and highly esteemed members. He was universally styled "the Major" because of his brilliant army record. He was born at Wilmington, Del., November 21, 1834. His parents removed to Akron, Ohio, while he was a child, and he was there educated. When a young man he removed to Cleveland, learned cabinet making, and followed that trade for a number of years. On the outbreak of the Civil War he enlisted as a private for three months' service in the Cleveland Grays. He then re-enlisted in an Ohio infantry regiment, and continued with it during the remainder of the war, seeing active service for the whole period. He was in Sherman's army up to the siege and occupation of Atlanta, and subsequently with Thomas' command, participating in the campaign which terminated in the defeat of Hood at Nashville. The regiment rejoined Sherman at Wilmington, N. C., and was engaged in the campaign through the Carolinas until the close of the war. He returned as lieutenant-colonel of his regiment, with a high reputation for personal bravery and exceptional qualifications for leadership. Shortly after the war he removed to the Lake Superior region, and for several years was manager of the Munising and Bay furnaces, at Grand Island, near Marquette, making charcoal pig iron. After a short experience in the Hocking Valley, Ohio, where he erected and operated a blast furnace, he returned to Michigan and built and operated a charcoal furnace for the Spring Lake Iron Company, at Fruitport. At the same time he managed another charcoal furnace at Bangor, Mich., near Fruitport. During his very successful career as a charcoal furnace manager he had the experience of furnishing the first pig iron used by the Northern Chicago Rolling Mill Company, at Chicago, for conversion into Bessemer steel. In 1883 he removed to Chicago and associated himself with Jay C. Morse, James Pickands, William L. Brown and Samuel Mather, forming the firm of Pickands, Brown & Co., who speedily became the leading pig iron commission merchants in the Northwest. He remained a member of this firm until his death. While actively engaged in this line, he and his associates at the same time were conspicuously identified with the opening up and development of the various iron ore districts of the Lake Superior region. For the past five years he had not taken an active part in the management of the firm's business and enjoyed a well earned respite from cares and responsibilities, spending much of his time in traveling. He visited Eastern Asia, sojourned for a time in the Sandwich Islands, and recently resided in California and Arizona. He was a man of quiet tastes and genial manners, and possessed the faculty of easily making and permanently retaining friends. He leaves a widow, but no children.

THOMAS C. COLEMAN.

Thomas C. Coleman, for many years prominently identified with the iron trade of Louisville, Ky., died on December 17, at his home, "The Meadows," near Shepardsville, Ky., at the age of 77 years. He was born in Cork, Ireland, and came to this country with his father, Thomas C. Coleman, Sr., in 1834. The father entered the steamboat business at Louisville, and became part owner of a line of steam packet boats. In 1849 he purchased the Louisville Rolling Mill, and was actively connected with the iron industry until his death in 1861. Thomas C. Coleman, his eldest son, was closely associated with his father in the iron business, and succeeded him as president of the Louisville Rolling Mill Company, continuing as head of the corporation during their existence. From that time up to the date of his death he had been in business with his son, Thomas C. Coleman, 3d, as an iron merchant.

JOHN C. PARKES.

John C. Parkes, formerly general manager of the North Chicago Rolling Mill Company, died in Chicago, December 23. Mr. Parkes was born in Staffordshire,

England, July 27, 1831. He was brought to this country by his mother in 1833, his father having preceded them one year. His father had been employed in the iron business in England, and continued in the same line here, working in various parts of the country. Mr. Parkes received his education in the common schools, and helped his father with his work in the mills. In 1852, when he was living with his parents in Wheeling, W. Va., he became imbued with the desire to become a gold miner, and went to California by way of the Isthmus of Panama. Not being very successful in mining, and his health failing, he abandoned that work and entered the newspaper business, editing and publishing a paper for several years. In 1863 he returned to the East, and going to Chicago became engaged with the North Chicago Rolling Mill Company in 1864. At that time his father was also an employee of the company. Mr. Parkes soon became a foreman in the mill, and worked his way up through various positions until he finally became general manager of the whole establishment. He continued with the company until the organization of the Illinois Steel Company in 1889. After his retirement he had not been connected with the iron trade.

NOTES.

SIBBETT MACRUM, cashier of the National Tube Company's Pittsburgh offices and treasurer of the Columbia Mfg. Company, died on December 15, aged 41 years.

JAMES MILHOLLAND, head of the firm of J. & J. B. Milholland, engine builders, of Pittsburgh, Pa., died December 16, at his home in that city, aged 64 years. Mr. Milholland was born in Allegheny, Pa., and had lived all his life in the two cities. He had been engaged for 40 years in the building of engines.

D. W. GODMAN of the firm of Godman & Thornhill, Richmond, Ohio, and for more than 30 years identified with business in that place, died from paralysis at Bloomington, Ill., on the 3d inst. Mr. Godman had been in failing health for the past two or three years, and in September last disposed of his interest in the hardware business to his partner, F. H. Thornhill.

JAMES HICKS, a prominent iron manufacturer of Cincinnati, Ohio, and a member of the Cincinnati Corrugating Company and the Piqua Rolling Mill Company, died on December 24, at the Waldorf-Astoria Hotel, New York, aged 40 years. The cause of Mr. Hicks' death was blood poisoning.

JOHN B. ANDERSON, for more than 20 years a member of the Anderson Steel Company of Pittsburgh, Pa., died on December 14, at his home in Bellevue, Pittsburgh, aged 68 years. Mr. Anderson was born in Pittsburgh, and was identified all his life with the business interests of that city.

CLARENCE H. KING, widely known as a mining expert and engineer, died on December 24, at Phoenix, Ariz., of pulmonary trouble, aged 58 years. Mr. King was identified with the organization of the United States Geological Survey, and was especially an authority on the mineral resources of Colorado. He was born at Newport, R. I., and was graduated from the Sheffield Scientific School.

COL. D. L. COCKLEY, who organized the Shelby Tube Company of Shelbyville, Ohio, died December 27 in that town, aged 58 years.

JAMES L. HAVEN, a pioneer foundryman, of Cincinnati, Ohio, died on December 21 at his home in that city after a long illness. He was 77 years of age, and was born in Cincinnati. After serving an apprenticeship with the foundry firm of Gardner & Co., he purchased a plant of his own, which he operated up to three years ago, when he retired from business.

THEODORE BERDELL died on December 30 at his home, at Summit, N. J., aged 55 years. He was born in Brooklyn, N. Y., and amassed a fortune through an invention for smelting ores. Mr. Berdell was a director of the International Metal Company and of the Consolidated Kansas City Smelting & Refining Company, and a heavy stockholder in the American Smelting & Refining Company. He was also a member of the American Institute of Mining Engineers.

PERSONAL.

President Charles M. Schwab of the United States Steel Corporation sailed for Europe with his family on Thursday of last week in the French liner "La Savoie." Mr. Schwab will remain on the Continent for two months.

Andrew Carnegie has offered to the city of Akron, Ohio, \$70,000 for a free public library, the city to guarantee \$7000 a year to maintain it.

F. T. F. Lovejoy, formerly secretary of the Carnegie Steel Company, has been elected a director of the Exchange National Bank, in Pittsburgh, in place of B. F. Jones, Jr., of Jones & Laughlins, Limited, who resigned in order to give more attention to private business affairs.

At a meeting of the Board of Directors of the Pressed Steel Car Company held on December 27 three vacancies in the directorate were filled by the election of Judge J. H. Reed and T. H. Given of Pittsburgh and H. E. Moller of New York. Judge Reed is the head of the firm of Knox & Reed of Pittsburgh and director of the United States Steel Corporation. Mr. Given is president of the Farmers' Deposit National Bank of Pittsburgh.

E. C. Willis, who has been connected with the A. B. Farquhar Company of York, Pa., for many years, has been appointed manager of the Altoona Foundry & Machine Company, Altoona, Pa.

R. Floyd Clinch of Crerar, Clinch & Co., pig iron, coal and coke merchants, Chicago, has presented Grace Episcopal Church of that city with a tower and a fine chime of bells. The bells were rung on Christmas Day for the first time, and were dedicated December 29 by Bishops McLaren and Anderson of Illinois.

The annual election of officers of the Illinois Steel Company occurred on December 21. E. J. Buffington was re-elected president, T. W. Robinson was elected first vice-president, F. H. Foote second vice-president, and T. J. Hyman was re-elected secretary and treasurer. Former First Vice-President Charles H. Foote has retired from business.

W. O. Carpenter has been elected secretary and treasurer of the Marinette Iron Works Mfg. Company, Marinette, Mich., to succeed A. L. Hamilton, resigned.

E. W. McKenna, president of the McKenna Steel Company of Joliet, Ill., has sailed for a prolonged tour, which will include India, Egypt and several European countries.

William C. Redfield of J. H. Williams & Co. of Brooklyn, N. Y., has been appointed Commissioner of Public Works for the Borough of Brooklyn by Borough President Swanstrom.

On January 1, 1902, the following appointments of the Pressed Steel Car Company of Pittsburgh went into effect: George H. Goodell, who has been assistant chief engineer for several months past, has been made chief engineer. He was formerly connected with the Northern Pacific Railway in the capacity of mechanical engineer, and has also had experience in various capacities on other railroads. G. H. Judy has been appointed superintendent of the McKee's Rocks works. He was formerly in the Pennsylvania Railroad services, and has been in the employ of the Pressed Steel Car Company as assistant superintendent at McKee's Rocks for some months.

William E. Reis, formerly president of the National Steel Company, will remove from New Castle, Pa., to New York City. Last week a farewell reception was given to Mr. Reis by the Lawrence Club in New Castle.

The Barrow Hematite, Steel & Iron Company (England) have just secured a contract for the Mildura, Victoria, Railway, totaling £33,487 9s. 3d. The quantities are 4715 tons of steel rails, 60 pound, at £6 2s. 1d. per ton; 200 tons steel fish plates, "A" design, at £7 13s. 7d., and 236 tons "B" design, at £9 15s. 4d. The delivery is the first 1500 tons within five months, the second 1500 tons within seven months, and balance of 1715 tons within eight months.

MANUFACTURING.

Iron and Steel.

The Youngstown Iron, Sheet & Tube Company will push work as fast as possible on the new blast furnace and open hearth steel plant, which are to be built at Haselton, where the sheet and tube mills of this concern are being built. It is probable the blast furnace will have a daily capacity of 500 to 600 tons, while the steel plant is expected to turn out 600 to 800 tons of steel per day. It will be recalled that this concern recently increased their capital stock from \$2,000,000 to \$4,000,000. The new stock will be offered first to present stockholders and then to the public.

Blast furnace No. 5 of the Cambria Steel Company, Johnstown, Pa., is being rebuilt and will be equipped with automatic skip and other modern devices.

At Youngstown, Ohio, the Brown-Bonnell Iron Company have been legally dissolved.

The Struthers Iron Company have their blast furnace at Struthers, Ohio, ready to start, but have not yet put it in operation on account of the scarcity of coke. The stack has been rebuilt, and is expected to make from 300 to 350 tons of basic metal per day.

It is stated by one of the directors of the United States Steel Corporation that production and sales of tin plate by the American Tin Plate Company for 1901 will amount to as much as during the year 1900. The strike this year had no more effect on output and sales than did the adjustment of the wage scale which closed the mills in 1900, so it is claimed.

The Tennessee Coal, Iron & Railroad Company, Birmingham, Ala., advise us that their new rail mill is about completed, and they expect to get it into operation in the course of a month or six weeks.

The charcoal furnace of the Pacific Steel Company, at Irondale, Wash., went into blast December 14, and has been running smoothly ever since, making good grades of foundry iron. The stack is 51 feet high and 10 feet 4 inches bosh, and has a capacity of 50 tons per day. The ore used comes from the mines on Texada Island, off the coast of British Columbia.

The officers of the recently incorporated Norwalk Iron & Steel Company, of Norwalk, Ohio, will be: President, J. E. Carnahan of Canton; attorney, A. M. Beattie of Norwalk; secretary and treasurer, James G. Gibbs of Norwalk, and general manager, E. E. Erikson of Pittsburgh. Ground will shortly be broken for the erection of a complete and modern plant on a 25-acre plot which the company have obtained just north of the city of Norwalk. The plant will make a specialty of tool steel.

The Crawfordsville Wire & Nail Company, Crawfordsville, Ind., advise us that they will rebuild their plant at once, the stockholders having contracted to meet an assessment of 50 per cent. on the face of their holdings, which amount, \$50,000, covers the recent loss by fire and places them upon the same footing, financially, as before the fire. There will be but very little new equipment required, as almost all the machinery used in the old plant can be worked over and put in good shape.

The report that the blooming mill at the Edgar Thomson Steel Works of the Carnegie Steel Company would have to close down for several weeks on account of the breaking of the fly wheel, is incorrect. The entire Edgar Thomson plant started up the day after Christmas, after a shut down of only one day, and is now in full operation.

The Newport Rolling Mill Company, Newport, Ky., are about completing three new finishing mills and two cold rolled mills, which they expect to have in operation about the middle of February, for rolling steel sheets of sizes from 10 gauge up, and from 42 inches wide to 120 inches long. They inform us that their mills have been running continuously for the past year, with but two weeks' intermission, and are full up on orders for the first quarter of 1902, they having turned down a large tonnage in the corrugating and roofing departments during the past three months.

No. 2 furnace of the E. & G. Brook Iron Company, Birdsboro, Pa., which blew out in March, 1901, is being prepared for another blast and will blow in in about two months.

General Machinery.

The Star Rig Reel & Supply Company, Clarksburg, W. Va., have just about completed a plant, entirely equipped with new and modern machinery, for the manufacture of rig iron outfits, portable rigs, bolted derricks and planing mill work of every description. In addition they are dealers in boilers, engines, cordage and oil well supplies, catering particularly to oil country trade. Charles S. Smiley is president.

We are advised by the Piermont Paper Company of Piermont, N. Y., that the recently organized Haverhill Box Board Company, Haverhill, Mass., are in the market for three paper machines, shafting, engines, boilers, iron work, &c., all of which will be ordered within the next 15 to 30 days, when the plans will be ready. All communications should be addressed to M. R. Williams & Co., Haverhill, who will erect the plant. The mill will have a capacity of 75 tons of paper box boards per day, the

same as that of the Chicago Coated Board Company of Chicago, which is also owned by the same company. Those interested in the new company are Crawford Fairbanks of Terre Haute, Ind.; M. R. Williams of Haverhill, Mass.; B. I. Harter of Chicago, Ill.; W. J. Alford of Anderson, Ind., and W. S. Lowe of Lima, Ohio.

C. N. Sherman of the Brownville Iron Works and J. Cooper Stebbins of Watertown, N. Y., have purchased a half interest in the Carthage Machine Company, Carthage, N. Y. The new company have purchased the real estate and buildings connected with the plant, which they will thoroughly overhaul and improve. New buildings will be erected, and new machinery installed. Paper and pulp mill machinery will continue to be the product of the works.

The Iowa Can Company, Des Moines, Iowa, manufacturers of tea, coffee and spice cans, &c., are in the market for presses, &c., for small work. The company were organized early in 1901 and began business in a plant on Third street. Increased business compelled them to seek larger quarters, and they have leased a building, containing about 40,000 square feet of floor space, which they are fitting up for operation.

The Hildreth Motor & Pump Company, Lansing, Mich., are purchasing the equipment for the new three-story brick building, 20 x 54 feet, they are to erect. This includes an 18 inch x 8 foot lathe, 20-inch shaper, 20-inch drill press, modern tools and a new or second hand power elevator. The new company are a reorganization of Hildreth & Co., manufacturers of iron pumps and supplies, and will continue the manufacture of the same line as heretofore, to which will be added the manufacture of gas and gasoline motors from 1 to 12 horse-power.

The Sample Lumber Company of Birmingham, Ala., have awarded the contract to W. F. May & Co. for the erection of machine shops and an additional planing mill at their plant at Hollins, Ala.

The Birmingham Railway, Light & Power Company, Birmingham, Ala., will erect large car barns and machine shops at a cost of about \$100,000. The buildings will be of brick and steel and will cover an entire block. This company recently acquired the Bessemer & Birmingham Railroad, and are now engaged in changing the line from a dummy into a modern electric road.

The Salisbury Wheel & Mfg. Company, Jamestown, N. Y., recently organized, are looking around for a site upon which to erect a plant for the manufacture of automobile, carriage, wagon and fire engine wheels, and probably a full line of pulleys. It is their intention later to construct a malleable steel plant, bending works, machine shop, &c. The officers are W. F. Stitt, president; C. W. Salisbury, vice-president and superintendent of construction, and S. H. Penfield, secretary and treasurer.

W. B. Mershon & Co., Saginaw, East Side, Mich., formerly manufactured band resaws in connection with a general lumber business, but as the premises they formerly occupied were needed by Mershon, Schuette, Parker & Co., they purchased adjoining premises, reorganized for the manufacture of their band resaws and band sawing machinery exclusively, with a capital of \$50,000. The contract for the erection of the machine shop is let, orders for additional machinery placed, and they expect to have the new show in operation on or about March 1. The machine shop will be driven in the main by electrical motors.

The Clyde Iron Company, Duluth, Minn., are arranging to make considerable improvements in their manufacturing facilities. They will enlarge their machine shop department and will also engage in the manufacture of chains. For these purposes they will erect a three-story building, 40 x 100 feet, and another building to be one story, 40 x 192 feet. This chain factory will be the first of its kind in the extreme Northwest.

The W. C. Toles Company, Chicago, have been incorporated to manufacture machinery, tools and wood and iron specialties, with a capital stock of \$50,000, by Wilford C. Toles, Emily A. Toles, and H. M. St. Clair.

The stock of the Vulcan Iron Works Company, Seattle, Wash., has been sold to I. Hulme and H. P. Strickland, who have reincorporated under the name of the Vulcan Iron Works, with a capital stock of \$150,000. The company are manufacturers of machinery, and the new owners being practical men may be expected to greatly enlarge the business. The property of the company is extensive, comprising a well equipped plant.

Boilers, Engines and Accessories.

The Shrewsbury Motor Works, Fair Haven, N. J., recently organized, will erect a plant at that place for the manufacture of gas and gasoline engines, both marine and stationary, also launches, &c. Clarence C. Smock is vice-president.

George E. Smith, Mayor of Frederick, Md., informs us that that city will soon be in the market for additional equipment for the electric light plant. Definite plans have not as yet been decided upon, but it is probable that a new 150 to 200 horse-power engine, with corresponding boilers, and four dynamos will be required.

Bridges and Buildings.

Press dispatches state that the Government of New Zealand have decided in the future to order all steel bridges from the United States. This decision comes as a result of the recent ex-

perience of the Manawatu Railway Company, when the American bid on a large steel viaduct amounted to one-quarter of the price bid by English firms.

Foundries.

The Berry-Horn Coal Company of St. Louis, Mo., have established a department of foundry supplies in connection with their business for the handling of foundry coke, facings, molding sand, graphite, sea coal, Blossburg and Piedmont smelting coal, &c. They are the Western agents of the J. S. McCormick Company of Pittsburgh, Pa. The new department has been placed in charge of B. F. Miller, recently manager of the St. Louis agency of the Sloss-Sheffield Iron & Steel Company.

The Monessen Foundry & Machine Company have purchased five acres at Monessen, Pa., opposite the plant being built by the Pittsburgh Steel Company, and have let the contract to the American Bridge Company for a building 72 x 230 for foundry purposes. Other buildings will be erected, and the plant which has been operated for three years will be abandoned. The company may make chilled and sand rolls.

The Westinghouse Company, Schenectady, N. Y., manufacturers of agricultural machinery, have decided to extend the foundry to more than double its present capacity. The plans are prepared and work will be started within a short time. All necessary additional equipment has been purchased.

Calvin Pardee & Co., Lattimer Mines, Pa., miners of coal, will install a modern foundry in connection with their smith and machine shops. While these shops and foundry are primarily intended for doing their own work, it is their intention to do work for the surrounding collieries.

David S. Creswell, 837 Race street, Philadelphia, Pa., proprietor of the Eagle Iron Foundry, Nicetown, is having plans prepared for a new foundry building, which will be ready about Jan. 15. Preliminary plans call for a two-story brick and iron building, 53 x 191 feet.

Fires.

The National Wheel Company suffered a \$15,000 loss by fire at their plant at Jackson, Mich., last week. The company were recently absorbed by the Jackson Vehicle Company.

The Great Springs paper mill, at Salisbury Deer Park, N. J., was recently destroyed by fire; loss, about \$20,000.

The knitting mill of J. G. Byars, North Hoosick, N. Y., was recently destroyed by fire. The loss is estimated at about \$15,000.

The large creosoting works of the Southern Pacific Railroad Company, near Houston, Texas, were destroyed by fire December 24. The loss will reach nearly \$100,000.

The cotton oil mill plant at Florence, N. C., owned by the Virginia-Carolina Chemical Company, with 600 tons of cottonseed and products, and four freight cars of the Atlantic Coast Line Railroad, were burned December 25. The value of the mill and plant is estimated at about \$40,000, and of the stock and products at about \$40,000. Insurance on mill buildings and machinery, \$16,000; on stock about \$10,000.

The Simon Lumber Company's warehouse, sash and blind factory and storage plant, at Cleveland, Ohio, were destroyed by fire last week; loss, about \$50,000.

The large plant of the J. S. Graham Machine Company, at Rochester, N. Y., was totally destroyed by fire December 25. The loss is estimated at about \$100,000.

The factory of the Crystal Springs Company, at Watertown, Mass., was burned December 27, the loss reaching about \$40,000, fully covered by insurance. The company make starch and flour.

Denlinger Brothers' oil refinery, on Smallman street, Pittsburgh, Pa., was destroyed by fire December 26. The loss is estimated at about \$20,000.

The foundry of George L. Mesker, at Evansville, Ind., was destroyed by fire December 25. The loss is about \$60,000, with about \$30,000 insurance.

The repair shops at Kingsland, N. J., of the Delaware, Lackawanna & Western Railroad Company suffered an \$85,000 loss by fire December 24.

Hardware.

Randallman & Sons, manufacturers of the Gee Whiz washing machines and wooden novelties, Des Moines, Iowa, will erect a new building early the coming spring, which will double the capacity of the plant. The factory was located in Des Moines a year ago, and the business of the company has been steadily growing since then.

Wrightsville Hardware Company, Wrightsville, Pa., advise us that they continue very busy in all departments of their plant. Shipments of general castings have made a marked increase and export deliveries have been quite numerous. The general conditions of the trade, both foreign and domestic, have been very satisfactory and business for 1902 appears favorable.

The Tuthill Spring Company, Chicago, Ill., are running full force, and did so all through the summer months. They report their November business the largest of any month in their history. They have bought additional machinery to provide for

the larger volume of business expected during the coming season.

Henry Disston & Sons, Philadelphia, Pa., have within the past two years increased their capacity 40 per cent., and by the first of April next expect to enlarge their manufacturing facilities at least 10 to 15 per cent. more. This will place them in better position to look after their growing business in saws, files and carpenters' tools.

Heller Brothers Company, Newark, N. J., have greatly increased their plant and facilities during the past six months, so that they are now in a position to make much prompter shipments of all goods included in their line.

The Bridgeport Chain Company, Bridgeport, Conn., have additional machinery under construction which will give them an increased capacity of 5000 feet daily. In addition to their present facilities, a spur track will shortly be run along side their mill, so that the trade will receive better service than in the past. Hurried orders to catch outgoing steamers are now delivered in New York within 24 hours after they are received.

The Boston Woven Hose & Rubber Company, Boston, Mass., have recently installed a belt press with a capacity of 8 tons of belting per day, which is referred to as the largest ever manufactured. The company have recently completed two orders for elevator belting aggregating 40 tons.

The Ford Auger Bit Company, Holyoke, Mass., have been obliged to increase their output to keep up with the growing demand for the Ford augers and bits, and have added a number of new machines.

Stowell Mfg. Company, Jersey City, N. J., manufacturers of fire proof asphalt roofing, asphalt paint, &c., are largely increasing their facilities, and are getting into a position where they will be able to make prompt shipment of all orders.

Miscellaneous.

The Randolph-Clowes Company, Waterbury, Conn., manufacturers of brass and copper tubes, &c., advise us that the report that they would move their plant to Buffalo, N. Y., is incorrect.

The Stevens Air Brake Company have been organized at Skowhegan, Maine, for the purpose of manufacturing devices for controlling the operation of cars. H. M. Heath of Augusta is president and A. K. Butler of Skowhegan is treasurer. All communications should be addressed to Mr. Butler.

The National Railway Supply Company, 404-407 People's Bank Building, Denver, Col., are about to place on the market the Dunn automatic car coupler, the invention of C. A. Dunn of that city. Offices in Chicago, New York and Boston will probably be opened in the near future.

The Harrison Dust Guard Company of Toledo, Ohio, will equip with their dust guards 1000 cars to be built for the Pittsburgh & Lake Erie Railroad by the Pressed Steel Car Company, 1000 cars of the Bessemer & Lake Erie to be built by the same concern, 706 cars for the Pere Marquette, being built by the American Car & Foundry Company, and 2000 cars to be built for the Wheeling & Lake Erie Railroad.

The Johannesburg Mfg. Company, Grayling, Mich., are building a new plant for the manufacture of veneering.

The Forsberg Spring & Gear Company, Rome, N. Y., manufacturers of gears, springs, irons and wagons in the white, have purchased the plant, tools and machinery of the receiver of the Pell Gear Company.

The Pocasset Worsted Company, Thornton, R. I., will double their capacity by the erection of a new mill, 80 x 225 feet, of brick, three stories. Building will be commenced as soon as weather will permit.

Robert Jacob, ship and yacht builder, City Island, New York City, has leased a strip of land adjoining his plant to Mr. Ratsey, the English sail maker, for a sail manufacturing plant. Mr. Jacob is placing the bids for the erection of a three-story structure, 50 x 175 feet, to be equipped with electrical power suitable to run a large number of machines. The plant will be in operation by April.

The Chicago Brass Company, Kenosha, Wis., manufacturers of brass and copper sheets, tubing rods, &c., will discontinue their Chicago house, removing that branch to Kenosha.

The A. Vogler Sheet Metal Mfg. Company, St. Louis, Mo., have incorporated with a capital stock of \$15,000 and have opened a factory at 24 South Main street, for the manufacture of oil and gasoline tanks, bathtubs, and all kinds of cans and containers. The officers are A. Vogler, president and manager, formerly of the firm of Vogler & Blanke, and H. Goldsmith, secretary and treasurer.

Some little equipment is required by the Elk Rapids Iron Company, Elk Rapids, Mich., who are erecting a flooring plant, 60 x 200 feet, with engine and boiler room 35 x 60 feet. They are also building in connection a dry kiln, 57 x 83 feet, with three compartments. The factory will be built entirely of cement, a new patent machine being used to erect hollow walls. The product will be maple and beech flooring and maple mattress frames.

A contract for more than \$1,000,000 worth of machines has just been entered into by the Fox Typewriter Company of Grand

Rapids, Mich. This is one of the largest orders ever given for typewriters. The machines are to go to Europe, and the contract in question covers a period of five years. A shipment is now being made on this contract. The Fox Company had previously shipped many machines to Europe, and the machines to fill this big order will be similar in design to those which have been used to meet the export trade. During the past month the company have made shipments of their machines to Mexico, Yucatan, Australia, India, China, Germany and Italy, most of the orders being duplicates. To turn out this large amount of orders in addition to the regular and growing business of the company may require an extension of the facilities of the factory on Front street.

The Louisville & Atlantic Railroad have placed an order with F. M. Hicks of the Hicks Locomotive & Car Works, Chicago, Ill., for three coaches; two of them to be straight passenger, with oak interior finish, seats upholstered in crimson plush, double chandelier lamps, Miller platforms, Janney couplers, Westinghouse quick action air brakes, four steel tired wheel trucks; and the third to be a combination mail and baggage car, 55 feet long, steel tired wheels, and the same general specification; a 45-ton eight-wheel locomotive, 55-inch boiler, 201 flues, 160 pounds steam pressure, American equalized brakes, and a 3500-gallon tank.

The Chicago Tin Can Company have been incorporated at Chicago, with a capital stock of \$20,000, by Moses Giel, Aaron Adelman and Henry Cohen.

The Beverleigh Mfg. Company, Ballard, Wash., are erecting a two-story factory, 22 x 40 feet, to manufacture a newly patented piston and pump packing.

The Johnston Railroad Frog & Switch Company, Chester, Pa., will enlarge their shop by the erection of an addition, to be used as an erecting shop. No new equipment is required at present.

The Stewart Boiler Works have received an order for 21 keirs for the Lonsdale Company of Lonsdale, R. I., the price being in the neighborhood of \$15,000. The keirs are of 5-ton capacity and are 9 feet 6 inches in diameter and 14 feet in height. The keirs will be used in bleaching cotton goods.

The American McKenna Process Company.

The two plants of the American Process Company, at Joliet, Ill., and at Kansas City, Mo., were built entire, from foundations to buildings, including all equipment, by the Lewis Foundry & Machine Company of Pittsburgh. This concern have received a contract from the American McKenna Process Company for a new plant, to be located at Tremly Point, N. J. In order to meet the requirements of the trade, the McKenna Process Company have established plants in different sections of the country so as to prevent freight rates from eating up the savings made by making over old rails. The building of the plant in the East will be the first attempt on the part of the company to get into the Eastern market. It is claimed that many of the rerolled rails are considered the best for sidings and freight yard use. They are also used for spurs and small lines running off the main line to mines and mills. The new equipment will consist of three heating furnaces, 36 feet long, and will be able to handle all rails that are used on any of the Eastern lines. It is intimated that a plant of a similar kind will be built in the vicinity of Pittsburgh soon, which will take care of the old rail market in that district. It will supply coal mines and electric railways with steel rails where lighter rails are used than are demanded for the modern steam road traffic. The reduction in weight in rerolling, and which really only amounts to a reshaping of the old rails, is not as great as 33 to 50 per cent., as stated, but instead amounts to but 9 to 12 per cent. As the old rails in reshaping are rolled at a very low heat, much lower than when first made, their second use by the railroad company has been highly satisfactory. The McKenna Process Company have been very successful since they engaged in the business of rerolling old rails, and the new works at Tremly Point, N. J., will be an advance on their two earlier constructed plants in methods and machinery. The new plant is expected to be in operation in the spring of 1902, and will take care of the New England and Southern trade, the latter by vessels along the coast. It is only during the summer months, say, four to five, that operations are conducted.

Andrew Schrock, president of the Mine Car Mfg. Company of Canal Fulton, Ohio, died on December 11, at his home in that town.

The Iron and Metal Trades.

The American Iron trade enters the new year with prospects which could not be better. The tonnage already placed for delivery during 1902 is very large, and there is such overwhelming evidence of an unparalleled consumption that the continuance of present very remunerative prices for the first six months is regarded as absolutely assured. As a matter of fact the great majority of those who are connected with the industry profess to feel certain that 1902 will go into history as one of its banner years.

Taking the whole range, prices of Iron and Steel are not high, although they yield a very good profit to all well equipped, well managed plants. That they are not checking domestic consumption is obvious, however completely they may cut off exports in view of the low values created by the depression abroad. The problems which the foreign markets may bring will apparently not press for a solution during 1902.

There is no truth in the reports that the prices of Lake Ores have been fixed at a higher level than last season for certain grades. Nothing has been decided yet, since the work of the committees has not been completed.

The railroad embargo continues and furnaces are being banked right and left. While thus the scarcity of Pig Iron is being emphasized, the fact must not be forgotten that consumption is being interfered with from the same causes. This means that the usual time of slackening in winter is being postponed, so that it looks now as though we will be in the midst of the spring rush without a breathing spell.

The Iron trade is noting with satisfaction that a number of the leading railroad lines are advancing wages. The conviction has been gaining ground that the business of the transportation lines would be handled more effectively if concessions were made to labor, which is disgruntled.

Prices for Pig Iron are hardening and yet the buying of Foundry Iron, widely distributed, continues. Quite a number of good sales are reported from different leading distributing centers. In all producing sections an increasing number of makers are showing a disposition to demand higher prices, so that the tendency is moderately upward.

Steel Billets continue scarce, but the prices for prompt delivery for small lots really possess little significance. The great mass of the Steel is rolled into finished shapes by the works themselves and of the balance which goes from Steel plant to outside rolling mill, nearly all is sold either on sliding scales or on long time contracts at considerably lower than the spot quotations.

From the different finishing mills come good reports. The Rail trade is on the *qui vive* over the two Mexican orders for 105,000 tons for one road and 350,000 tons for another. It promises to be a pretty international fight. In the Sheet trade the mills appear to be catching up, and the markets are somewhat easier.

A Comparison of Prices.

At date, one week, one month and one year previous.

Advances Over the Previous Month in Heavy Type.
Declines in Italics.

	Jan. 2, 1902.	Dec. 25, 1901.	Dec. 4, 1901.	Jan. 2, 1901.
PIG IRON:				
Foundry Pig, No. 2, Standard, Philadelphia	\$16.00	\$15.75	\$15.50	\$15.50
Foundry Pig, No. 2, Southern, Cincinnati	14.95	14.25	14.25	13.75
Foundry Pig, No. 2, Local, Chicago	15.50	15.50	15.50	15.00
Bessemer Pig, Pittsburgh	16.75	16.50	16.00	13.25
Gray Forge, Pittsburgh	15.50	15.25	14.75	13.25
Lake Superior Charcoal, Chicago ..	18.50	18.50	17.50	19.50
BILLETS, RAILS, ETC.:				
Steel Billets, Pittsburgh (nom)....	27.00	27.00	28.00	19.75
Steel Billets, Philadelphia (nom)...	29.00	29.50	28.00	21.00
Steel Billets, Chicago, (nom).....	.....	.....	.....	20.75
Wire Rods (delivered).....	34.50	34.25	35.00	.....
Steel Rails, Heavy, Eastern Mill..	28.00	29.00	28.00	26.00
Spikes, Tidewater.....	2.00	2.00	2.00	1.50
Splice Bars, Tidewater.....	1.65	1.65	1.65	1.35
OLD MATERIAL, PER GROSS TON:				
O. Steel Rails, Chicago.....	14.00	14.00	14.00	11.00
O. Steel Rails, Philadelphia.....	18.00	18.00	17.50	16.00
O. Iron Rails, Chicago.....	21.00	21.00	21.00	17.50
O. Iron Rails, Philadelphia..	21.50	21.50	21.50	19.00
O. Car Wheels, Chicago.....	16.00	16.00	15.50	15.50
O. Car Wheels, Philadelphia (nom)..	16.75	16.75	16.25	17.00
Heavy Steel Scrap, Chicago.	13.50	13.75	13.50	11.00
FINISHED IRON AND STEEL, PER POUND:				
Refined Iron Bars, Philadelphia...	1.65	1.65	1.65	1.45
Common Iron Bars, Chicago.....	1.65	1.65	1.65	1.45
Common Iron Bars, Youngstown..	1.50	1.50	1.55	1.30
Steel Bars, Tidewater.....	1.70	1.70	1.70	1.40
Steel Bars, Pittsburgh.....	1.50	1.50	1.50	1.25
Tank Plates, Tidewater.....	1.78	1.78	1.78	1.55
Tank Plates, Pittsburgh.....	1.60	1.60	1.60	1.40
Beams, Tidewater.....	1.75	1.75	1.75	1.65
Beams, Pittsburgh.....	1.60	1.60	1.60	1.50
Angles, Tidewater.....	1.75	1.75	1.75	1.55
Angles, Pittsburgh.....	1.60	1.60	1.60	1.40
Skelp, Grooved Iron, Pittsburgh..	1.75	1.75	1.80	1.50
Skelp, Sheared Iron, Pittsburgh..	1.80	1.80	1.85	1.55
Sheets, No. 27, Pittsburgh.....	2.90	2.90	2.90	2.85
Barb Wire, f.o.b. Pittsburgh.....	2.90	2.90	2.90	2.80
Wire Nails, f.o.b. Pittsburgh.....	1.95	1.95	2.05	2.30
Cut Nails, Pittsburgh.....	2.05	2.05	2.05	1.95
METALS:				
Copper, New York (nom).....	11.75	12.00	16.50	17.00
Spelter, St. Louis	4.12½	4.15	4.30	3.95
Lead, New York.....	4.00	4.00	4.37½	4.37½
Lead, St. Louis.....	3.95	3.95	4.25	4.30
Tin, New York.....	33.50	33.30	34.50	36.75
Antimony, Hallett, New York....	8.25	8.25	8.37½	9.25
Nickel, New York.....	60.00	60.00	60.00	55.00
Tin Plate, Domestic Bessemer, 100 lbs., New York.....	4.19	4.19	4.19	4.19

Chicago.

FISHER BUILDING, December 31, 1901.—(By Telegraph.)

The situation could hardly be stronger. Consumption has reached proportions exceeding anything before known. Furnaces and mills have their product sold far into the future and it is difficult to place new business in any line for anything like early delivery. Manufacturing consumers are constantly finding themselves short of needed material and are embarrassed in their operations because the railroads are utterly unable to satisfactorily move the great traffic now pouring in on them. This is particularly noticeable in the Coke and Pig Iron trade. The shortage of Coke continues and appears to be growing worse. It is stated that no less than 12 furnaces in this vicinity are now banked, and that unless an early improvement takes place more will follow. The demand for finished products is so strong and the producing capacity is so heavily taxed that only the conservative policy of the leading manufacturers keeps prices down. The conditions are all extremely favorable for much higher values if it were not for their attitude. The only exception to this condition of general strength is in the case of Wire products, in which prices are inclined to weakness in the face of a very heavy demand.

Pig Iron.—The output of local furnaces is still heavily curtailed by the short supply of Coke. More furnaces have been banked the past week, and unless the supply speedily increases others will follow their example.

The quantity of Foundry Iron now being made in this vicinity is very small. This contributes to the strength of the Pig Iron situation, which is in such a condition that it would be strong even if the local furnaces were able to run as usual. The foundry trade is exceedingly active in all branches and the consumption of Iron is running beyond any previous experience. The foundrymen who are not receiving shipments on contracts made with local furnacemen are compelled to turn to the furnaces in other districts. The Malleable foundrymen are particularly distressed, as they have heretofore been so excellently supplied from local sources. They will be obliged in many cases to close their works if the situation is not soon relieved. The foundrymen are hit by the Coke shortage in two ways, not only by their inability to secure enough Iron, but also by the lack of fuel to keep their cupolas running. The demand for spot Iron is heavy and some excellent contracts have been placed during the week. The Southern furnaces have profited most from the scarcity of local Iron. The railroads hauling Southern Iron north of the Ohio River will not make the advance in freight rates January 1 which had been expected. It appears that the talk about the advance was only done to stiffen up some of the roads interested. Some furnaces have advanced their price 50 cents per ton during the week, but as yet enough sellers are found at the old rates to justify continuing former quotations. We quote as follows:

Lake Superior Charcoal.....	\$18.50 to \$19.25
Local Coke Foundry, No. 1.....	16.00 to 16.50
Local Coke Foundry, No. 2.....	15.50 to 16.00
Local Coke Foundry, No. 3.....	15.00 to 15.50
Local Scotch, No. 1.....	16.00 to 16.50
Ohio Strong Softeners, No. 1.....	17.00 to 17.85
Southern Silvery, according to Silicon.....	16.15 to 16.40
Southern Coke, No. 1.....	15.65 to 16.15
Southern Coke, No. 2.....	15.15 to 15.65
Southern Coke, No. 3.....	14.65 to 15.15
Southern Coke, No. 1 Soft.....	15.65 to 16.15
Southern Coke, No. 2 Soft.....	15.15 to 15.65
Foundry Forge.....	14.15 to 14.65
Southern Gray Forge.....	14.15 to 14.65
Southern Mottled.....	14.15 to 14.65
Southern Charcoal Softeners, according to Silicon.....	15.50 to 16.50
Tennessee Silicon Pig.....	16.40 to 16.65
Alabama and Georgia Car Wheel.....	19.50 to 20.50
Malleable Bessemer.....	17.00 to 17.50
Standard Bessemer.....	..... to 17.50
Jackson County and Kentucky Silvery, 8 per cent. Silicon.....	17.60 to 17.85

Bars.—The demand has been extraordinary for December. The leading Bar manufacturers report double the tonnage in December which they secured in November. One of the leading companies are now refusing to take any more business in Steel Bars for delivery prior to July 1. Mill shipments are continued at 1.65c. to 1.80c., Chicago, for either Bar Iron or Soft Steel, and 2.05c. to 2.20c., base, for Hoops. Jobbers report a strongly maintained demand from store, quoting Bars 1.90c. to 2c., and Steel Hoops, 2.50c., base.

Structural Material.—This branch of trade continues active, with numerous small orders being placed daily. More large building projects are coming up and the outlook in the building trade in this city is steadily growing brighter. Mill shipments are quoted as follows: Beams, Channels and Zees, 15 inches and under, 1.75c. to 1.90c.; 18 inches and over, 1.85c. to 2c.; Angles, 1.75c. to 1.90c. rates; Tees, 1.80c. to 1.90c.; Universal Plates, 1.75c. to 1.85c.; small lots of Beams and Channels from local yards are quoted at 2.25c.; Angles, 2c. rates; Tees, 2.15c.

Plates.—Specifications are coming in freely against contracts and the old condition of dullness and hesitation has completely disappeared. All branches of this line are showing an improved feeling. Mill shipments are quoted as follows: Tank Plate, ¼-inch and heavier, 1.75 to 1.80c., Chicago; Flange, 1.85c. to 1.95c.; Marine, 1.95c. to 2.05c. Jobbers are selling small lots from store at 1.90c. to 2c. for Tank, and 2.25c. for Flange, with the usual extras for heads, segments, lighter gauges, &c.

Sheets.—New inquiries are coming up, covering large quantities, and the outlook is excellent for a continuance of activity. Prices show no indication of weakness. Mill shipments of No. 27 Black Sheets are held at 3.15c. to 3.40c., Chicago, and small lots from stock at 3.50c. to 3.70c. Small lots of Galvanized are maintained at 70 to 70 and 2½.

Merchant Pipe.—The independent mills are taking a great deal of the current business, but so far the competition from this direction has not been deemed sufficiently serious to affect prices. The demand is of the usual light volume at this season of the year. Carload lots are now quoted as follows, random lengths: Black, ½ to ¾ inch, 60 off; ¾ to 10 inches, 67 off; Galvanized, ½ to ¾ inch, 47 off; ¾ to 6 inches, 55 off.

Boiler Tubes.—No change has occurred in this line. Quotations are as follows:

	Steel.	Iron.
2½ to 5 inches.....	57½	47½
1½ to 2½ inches.....	50	40
1 to 1½ inches.....	35	30
6 inches and larger.....	52½	45

Merchant Steel.—New business is fair. Mill shipments, Chicago, are quoted as follows: Smooth Finished Machinery Steel, 2c. to 2.10c.; Smooth Finished Tire, 1.85c. to 2c.; Open Hearth Spring Steel, 2.30c. to 2.40c.; Toe Calk, 2.40c. to 2.60c.; Sleigh Shoe, 1.85c. to 1.90c.; Cutter Shoe, 2.40c. to 2.60c.; Colled Rolled Shafting, 55 off in carload lots. Ordinary grades of Crucible Tool Steel are quoted at 6¼c. for carloads and 7c. to 7½c. from store; Specials, 12c. upward.

Rails and Track Supplies.—Those who need supplies of Heavy Steel Rails for the coming year are now finding it almost impossible to secure even the smallest quantities until very late in the fall. Manufacturers are in constant receipt of inquiries from parties who represent themselves in great need of Rails in the spring, but the mills have their product so well sold up that it is impossible to even promise them a possibility of filling their orders. The demand for Light Rails has been very strong during the month, the local mills having booked orders for several thousand tons in excess of their output. Heavy Sections are continued at \$28, but Light Sections have been advanced and are now quoted at \$31 to \$35. Fastenings are in good demand and unchanged, as follows: Splice Bars, 1.70c. to 1.80c.; Spikes, 2c. to 2.10c.; Track Bolts, with Hexagon Nuts, 2.90c. to 2.95c.; Square Nuts, 2.75c. to 2.80c.

Old Material.—About the only demand for Old Material that is worthy of note is for Cast Scrap. The scarcity of Pig Iron is causing more business to be turned in the direction of Old Material, but buyers are prudently guarding against rushing up prices. The following are approximate quotations per gross ton:

Old Iron Rails.....	\$21.00 to \$21.50
Old Steel Rails, mixed lengths.....	14.00 to 14.50
Old Steel Rails, long lengths.....	19.00 to 20.00
Heavy Relaying Rails.....	25.50 to 26.00
Old Car Wheels.....	16.00 to 16.50
Heavy Melting Steel Scrap.....	13.50 to 14.00
Mixed Steel.....	10.50 to 11.00

The following quotations are per net ton:

Iron Fish Plates.....	\$16.00 to \$17.00
Iron Car Axles.....	20.00 to 21.00
Steel Car Axles.....	18.00 to 18.50
No. 1 Railroad Wrought.....	15.00 to 15.50
No. 2 Railroad Wrought.....	13.25 to 13.75
Shafting.....	16.00 to 16.50
No. 1 Dealers' Forge.....	12.15 to 13.00
No. 1 Bushing and Wrought Pipe.....	..... to 11.50
Iron Axle Turnings.....	11.25 to 11.75
Soft Steel Axle Turnings.....	10.50 to 11.00
Machine Shop Turnings.....	9.50 to 10.00
Cast Borings.....	5.00 to 5.25
Mixed Borings, &c.....	5.25 to 5.50
No. 1 Boilers, cut.....	11.00 to 11.50
No. 2 Boilers, cut.....	10.00 to 10.50
Heavy Cast Scrap.....	11.50 to 12.00
Stove Plate and Light Cast Scrap.....	9.00 to 9.25
Railroad Malleable.....	12.50 to 13.00
Agricultural Malleable.....	11.50 to 12.00

Metals.—Copper is again lower, carload lots of Lake now being quoted at 13c., and Casting Brands at 12¼. Pig Lead continues at 3.95c. for Desilverized and 4.05c. for Corroding in 50-ton lots. The situation in Old Copper and Brass is still unsettled and dealers are not yet prepared to accept the low offers which are being made by consumers. It is therefore impracticable to make any quotations to represent the selling price at present. Small lots of Old Pipe Lead are being sold at 3.80c., and Zinc at 2.75c.

Coke.—The demand for Coke is strong, with a great deal of business being placed for future delivery. Some prominent Coke companies are now refusing to take any more orders for the first six months of the year. Others are quoting \$5 for 72-hour Foundry. The shortage of Coke is still causing a great deal of trouble among

foundrymen and spot Coke of any character readily brings \$6.

Philadelphia.

FORREST BUILDING, December 30, 1901.

The Iron and Steel markets have been in a practical condition of abeyance during the past week or two for reasons which are so well understood that they need no explanation. There are other reasons, however, which are so exceptional, and to warrant a few words of comment. First, there is such a congestion of business that attention is directed more to getting rid of what there is rather than to making further extensions. Beginning at the mines, and following on through the blast furnaces, rolling mills and to all consumers of their products, there is more or less of an embargo, which also applies to the facilities for transportation. New business is, therefore, chiefly confined to piecing out orders until normal conditions are reached, which from present appearances will not be in the very near future.

Prices are nominally the same as last week, but the undertone is very strong, and in many cases they are subject to special arrangement, as there are a great many buyers so needy that they will be compelled to get material or suspend work. Ordinarily conditions such as now prevail would be speedily overcome, but for weeks past they have been getting steadily worse instead of better, with nothing to indicate anything like substantial relief for a long time to come. Such a condition of prosperity following three or four years of extraordinary activity is probably unparalleled in the history of this or of any other country in all the wide world.

The scarcity of Pig Iron has caused decided advance of material for prompt delivery, \$16 to \$16.50 for No. 2 X is about the price, although \$16.75 has been paid for spot delivery.

Cleveland.

CLEVELAND, OHIO, December 30, 1901.

Iron Ore.—The reports are out this week that another sale of 250,000 tons of Iron Ore, delivered over a period of five years, has been made by an independent Ore producing concern to the Sharon Steel Company. The information obtainable is that the sale was made at the prevailing prices of \$4.25 for Bessemer and \$3 for Non-Bessemer. The sale, however, consists mostly of the higher grade of raw material. No vessel tonnage has been placed by which the movement of this material is assured, but the understanding is that the boats of the Hanna fleet will take care of the transportation at the season contract rate. No steps have been taken as yet looking toward the establishing of the rate of carriage for next season. In fact, it is not believed that anything of this sort will be done until after the meeting of the Ore Association, at which the selling price will be established. The preliminary conferences of the Ore men have left little doubt as to the result of this coming meeting. All indications are that the price of Ore will be identical next year with this year's figures, and upon this assumption the vessel men are prepared for the re-establishment of this season's rate for the transportation of the Ore next year. The sales of Ore by the independent concerns are taken as a part indication of the possible outcome of the Ore Association meeting, and, in addition, the general trend of the discussion among the Ore producers is toward the same point. The vessel men on the lakes are preparing a new bill of lading for Ore, which will contain a more definite clause on demurrage, and legislation on this point is expected at the lake carriers' meeting in Detroit in January.

Pig Iron.—The market has heard this week of Basic Pig Iron having been sold at two different prices. The first sales were at \$15.50, in the Valleys, followed a few days afterward by other sales on the basis of \$15.75 in the Valleys. At both of these prices good sized contracts have been taken and the market is looking up. Some of the furnacemen report that some of their stacks which were blown out early in December have not resumed operations as yet, because of the lack of Coke,

and the situation has not been relieved sufficiently to warrant any statement as to when operations will be resumed. All of them announce that, barring these delays and the forced idleness of the plants, they would have adhered tenaciously to the prices which prevailed a month ago, but the losses have made it necessary for them to advance the prices in order to reimburse themselves. The Bessemer situation is not better, for the material is very scarce. Some reports came in yesterday that 12 stacks had been banked in the Pittsburgh district because of the shortage of Coke, and the shortage of material is being seriously felt. Some of the railroads in this territory are at their wits' ends to meet the emergency. It is now generally known that the railroad employees all through this section are receiving voluntary advances in wages. Behind this is an effort to spur them on to greater earnestness for the movement of the material, that every possible advantage may be gained from the handling of the railroad equipment. The situation is so serious that some railroad men are reporting that the long stress upon their motive power has weakened it until it is impossible to get the full benefit of the power which is actually possessed. The car situation may be said, therefore, to control the Iron market. The sales of Bessemer have been continued at \$15.75 in the Valleys, which bids fair to remain the price at which deliveries will be made during the quarter. Foundry No. 1 and No. 2 is being sold at \$16 and \$15.50, respectively, in the Valley, with material increasingly scarce and deliveries next to impossible. Much of the material that is being produced is now being piled for lack of cars with which to move it.

Finished Material.—The car shortage has backed up on the Finished Material market and that trade is in a bad plight. Some of the mills report that it is not only impossible to get the necessary Iron, but it is also impossible to get cars with which to move the Steel from one department to another. One mill reports that Steel produced three months ago is still in piles, ready to be shipped when the cars shall have been furnished. The great agitation in the market this week, therefore, is for deliveries. In some respects this is having a serious effect. The shipbuilding companies are compelled to ease up on their winter work because they cannot get the Steel. Other users of Structural Material and Plates are in a similar plight. Despite this fact, the orders for Steel are still coming in, now considerably in excess of production. This has led to some talk of an increase in the price of certain grades, especially Plates and Structural Shapes, but so far the big concerns are adhering rigidly to the conservative policy and are refusing to ask more than is now being paid. The lack of Steel has compelled three mills to shut down during the week for the most of the time, and the curtailment of production is having a serious effect upon deliveries, especially on orders now being placed, delaying them further than would have been necessary under more auspicious circumstances. Plates and Structural Steel therefore are holding at the old prices of 1.70c., but firm at that. There has been some talk of a weakening of the Bar market, since the producing capacity is seemingly in excess of the market, yet no break has come or is expected. In fact the demand has increased, while the production is subject to the same curtailment as in other grades. The possibilities of deliveries here are no better than in other grades. The prices quoted continue to be 1.50c., Pittsburgh, on Bar Iron; 1.50c. for Bessemer Steel Bars, and 1.60c., Pittsburgh, for Open Hearth Steel Bars. The Rail market is comparatively quiet, due to the heavy sales recently made, and the price holds firm at \$28. The Sheet market is at a standstill, with most of the sales made out of stock. The store sales continue to be made at the old prices. On mill sales of carload lots the quotation on No. 27 is from 3.10c. to 3.20c., with the usual differences for less than carload lots.

Old Material.—The Scrap trade is very brisk. The demand is heavy, but the dealers are experiencing the universal difficulty of getting shipments. Some effort has been made to advance prices, but this has failed, consequently the quotations continue as follows: No. 1

Wrought, \$16.50 net; Cast Borings, \$8 gross; Wrought Turnings, \$12.25 gross; Cast Scrap, \$13 net; Stove Plate, \$10 net; Heavy Steel, \$17 gross; Steel Rails, \$17 gross; Old Iron Rails, \$22 gross; Old Iron Axles, \$19 gross; Old Car Wheels, \$17 gross.

Pittsburgh.

HAMILTON BUILDING, December 31, 1901.—(By Telegraph.)

Pig Iron.—The present condition of the Pig Iron market is without parallel. The furnaces have a heavy demand for their Iron, but are unable to get out product for want of Coke, and when Coke can be had there is difficulty getting cars to ship out their Iron. Large and small consumers are in distress for Pig Iron, and Steel works are running very light, unable to get metal fast enough. Furnaces are offering as high as \$3.50 a ton for guaranteed deliveries of Coke, but without getting it. Bessemer Iron to-day, where the furnace can make shipments, is all of \$16, Valley, and it is possible that some consumers would pay more for Iron if assured that they would get it. There have not been any heavy sales, simply for the reason that Iron cannot be had. There is a good deal of inquiry for Forge Iron, and the Valley furnaces talk of \$15.50 at furnace. This is a prohibitory price as far as the Pittsburgh market is concerned. The local market on Forge is \$15.50. Very little, if any, Valley Mill Iron is coming into this district. There is not a great deal of inquiry for Foundry Iron, as most consumers are covered, but the market is very firm. The Bessemer Furnace Association maintains its price of \$15.75, Valley, for Standard Bessemer, but outside Iron is strong at \$16 or \$16.75, Pittsburgh. Forge Iron is \$15.50, Pittsburgh, and Southern Forge is being offered here at that price, but no sales have been made. Foundry Iron is firm at \$16 to \$16.25 for No. 2, and \$16.50 to \$16.75 for No. 1, Pittsburgh. We note sales of about 5000 tons of Standard Bessemer at \$16, Valley. This price has been offered for large lots of Bessemer for second quarter delivery. Also 3000 tons of Gray Forge for January and February at \$15.50, Pittsburgh.

Billets.—Steel continues very scarce, for the reason that the mills cannot get Pig Iron fast enough. It is very difficult to quote the Steel market. Small lots of Billets for prompt shipment are held at \$27 to \$27.50 at maker's mill, and small lots are being sold at these prices. Large consumers of Steel, who are not covered by sliding scale contracts, but who have been buying steadily from one source, could probably place large contracts for Steel at \$25 a ton or slightly less, maker's mill.

Coke.—The situation in Coke is critical. Many ovens in the Connellsville region have been closed for lack of cars. Coke producers are trying to buy from outside sources to fill their contracts, but are unable to do so. It is said that nearly 250,000 tons of Coke are piled up in the Connellsville region awaiting cars for shipment.

(By Mail.)

The closing week of the year in the Iron trade is without special feature. The market is strong all along the line, and the volume of tonnage being placed is large for a period when buyers place as few contracts as possible. The Pig Iron market is very strong, and it is reported up to \$16.25 has been paid for second quarter Bessemer Iron. Steel continues scarce, and brings about \$27, Pittsburgh, for small lots. There is practically no change in prices of Finished Iron and Steel, and in Coke contracts have been made by some of the Valley furnacemen running through all next year at \$2.25 a ton at oven.

Muck Bar.—The higher prices ruling for Gray Forge Iron have stiffened up Muck Bar a little, and we quote standard grades at \$29.25 to \$29.50, delivered at buyer's mill. There is some inquiry in the market.

Rails.—No large lots have recently been placed. It is possible the tonnage for Mexico may be placed here. We quote at \$28, at mill.

Rods.—The market is somewhat quiet, and we quote ordinary Bessemer Rods at \$32.25 to \$32.50, maker's mill.

At present prices of Billets, small Rod mills cannot buy Steel in the open market and convert it into Rods at a profit.

Structural Material.—Some heavy contracts have been placed. The contract for the Wabash bridge at Mingo has been given to the American Bridge Company, and calls for over 6000 tons, the material going to a local mill. Other large contracts have been secured by this interest amounting to 20,000 tons or more. The Structural mills are crowded with work for the first three months of the year at least. No change in prices, and we quote: Beams and Channels, up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 up to 6 x 6 inches, 1.60c.; smaller sizes, 1.55c. to 1.60c.; Zees, 1.60c.; Tees, 1.65c.; Steel Bars, 1.50c., half extras, at mill; Universal and Sheared Plates, 1.60c. All above prices are f.o.b. Pittsburgh. Small lots of Beams and Channels for prompt shipment bring from 10c. to 25c. per 100 lbs. higher prices than the above.

Plates.—The market has improved a good deal, more new tonnage being placed and specifications on old contracts coming in more freely than for some time. The outlook for next year is regarded by the Plate mills as very good. Prices are firm, and we quote: Tank Plate, ¼-inch thick and thicker, up to 100 inches in width, 1.60c. at mill, Pittsburgh; Flange and Boiler Steel, 1.70c.; Marine, Ordinary Fire Box, American Boiler Manufacturers' Association specifications, 1.80c.; Still Bottom Steel, 1.90c.; Locomotive Fire Box, not less than 2.10c., and it ranges in price to 3c. Plate more than 100 inches wide, 5c. extra per 100 lbs. Plate 3-16 inch in thickness, \$2 extra; gauges Nos. 7 and 8, \$3 extra; No. 9, \$5 extra. These quotations are based on carload lots, with 5c. extra for less than carload lots; terms, net cash in 30 days.

Iron and Steel Bars.—Most of the leading Bar mills are still from four to six weeks behind on contracts, while others are pretty well caught up and can promise deliveries within 10 to 15 days. It is expected that some contracts that are being held back will be placed after the first of the year. Reports that concessions in prices are being made is absolutely denied by the mills in the agreement, and who claim fixed prices are being rigidly held. We quote Iron and Steel Bars at 1.50c. at mill in carloads and larger lots. Open Hearth Bars take \$2 a ton extra.

Ferromanganese.—Foreign 80 per cent. Ferro continues to be offered in this market at \$50 a ton, delivered. Domestic is held at \$52.50 in large lots.

Sheets.—The situation in Sheets is not as strong as it was some time ago. Most of the mills have pretty well caught up with back orders and are actively soliciting new tonnage. In some cases concessions in prices are being made for desirable orders. The general market on Black Sheets, box annealed, one pass through cold roll, in carload lots, is as follows: Nos. 10, 11 and 12, 2.40c.; Nos. 14 and 15, 2.50c.; Nos. 16 and 17, 2.60c.; Nos. 18 to 21, inclusive, 2.70c.; Nos. 22, 23 and 24, 2.80c.; Nos. 25 and 26, 2.90c.; No. 27, 3c.; No. 28, 3.10c.; No. 29, 3.25c.; No. 30, 3.35c. For large orders and extended delivery, Black Sheets can be bought on the basis of 2.75c. for No. 26, 2.85c. for No. 27 and 2.90c. to 3c. for No. 28. Small lots of Sheets bring about 3.10c. for No. 27 and 3.15c. for No. 28. We quote Galvanized Sheets at 70 and 5 off in carloads and 70 off in small lots, maker's mill.

Merchant Steel.—There is nothing of particular interest to note. Tonnage being placed is mostly for small lots, but will likely be larger at the first of the year. We quote: Tire Steel, best quality, 1.70c.; Toe Calk, 1.80c. to 1.85c.; Hammered Lay Steel, 3.50c.; Open Hearth Spring, 2.50c. to 2.75c.; Steel Bars, 1.50c., base, in carloads, and 1.60c. in small lots; ordinary Plow Slabs up to 6 inches wide, 2.25c.; over 6 inches wide, 2.40c. For ordinary orders we quote Cold Rolled and Cold Drawn Shafting at 60 per cent. off in carloads and 55 per cent. off in less than carloads, delivered at all points east of the Mississippi River. We quote Tool Steel at 6c. and upward, depending on quality.

Skelp.—The market continues quiet, but a better demand is looked for after the first of the year. We quote Grooved Iron Skelp at 1.75c. to 1.80c., and Sheared,

1.80c. to 1.85c., at mill. Grooved and Sheared Steel Skelp is held at about 1.75c., at mill, for ordinary widths.

Merchant Pipe.—Trade is somewhat quiet, but a better demand is looked for after the first of the year. Some of the Pipe mills that are in need of tonnage are shading prices. For ordinary business to consumers prices are as follows:

Merchant Pipe.	Black. Per cent.	Galvd. Per cent.
1/4 to 1/2 inch and 11 to 12 inch.....	61	48
3/4 to 10 inch.....	68 1/2	56
<i>Casing, Random Lengths.</i>		
2 to 3 inch.....	S. & S. 58	I. J. 53 1/2
3 1/4 to 4 inch.....	63	59
4 1/4 to 12 1/2 inch.....	65	61 1/2
<i>Casing, Cut Lengths.</i>		
2 to 3 inch.....	S. & S. 53 1/2	I. J. 59
3 1/4 to 4 inch.....	59	55
4 1/4 to 12 1/2 inch.....	61 1/2	57 1/2

For large orders and to jobbers prices are from 7 1/2 to 10 per cent. lower than the above.

Boiler Tubes.—The market is firm, and prices to consumers are as follows:

Boiler Tubes.	Up to 22 feet. Per cent.
Steel.	
1 inch to 1 1/4 inch and 2 1/4 inch to 5 inch, inclusive....	65 1/2
2 inch to 2 1/2 inch, inclusive.....	60
6 inch and larger.....	59
Iron.	
1 inch to 1 1/4 inch and 2 1/4 inch.....	43 1/2
1 1/4 to 2 1/4 inch.....	43
2 1/4 to 13 inch.....	53

Iron and Steel Scrap.—The market is quiet, and prices show a tendency to weakness. In fact, consumers who would place contracts now can buy Scrap at lower figures than ruled ten days or two weeks ago. We quote: No. 1 Wrought Scrap, \$17 net ton; Heavy Melting Stock, \$17.50 to \$18; Busheling Scrap, \$13; Cast Iron Borings, \$8; Old Iron Rails, \$21.50 to \$22, all in gross tons. On a firm offer it is probable the above prices would be shaded.

Coke.—Output of Coke in the Connellsville region last week was 232,528 tons, a decline over the previous week of over 6000 tons. Shipments were 7490 cars, more than 2000 cars less than the previous week. The car supply is reported somewhat better. We quote strictly Connellsville Furnace Coke on contracts running through next year at \$2.25 a ton at oven. Seventy-two-hour Foundry Coke is held at \$2.35 to \$2.50 a ton. Main Line Furnace Coke is \$1.90 to \$2, and Foundry is \$2.10 to \$2.25 a ton at oven.

New York.

NEW YORK, December 31, 1901.

Pig Iron.—The only sale of consequence in this district was of a lot of about 2000 tons, taken by a Connecticut foundry, one-half Southern and one-half Lehigh Valley Iron. The furnaces are having a good deal of trouble about fuel, but the founders, too, complain that they are embarrassed in this respect. Some of the Southern furnaces have advanced prices to the basis of \$12 for No. 2 Foundry, but one large interest is still naming \$11.50. We quote for Northern Irons: No. 1, \$16.50 to \$17.50; No. 2 X, \$16 to \$16.50; No. 2 Plain, \$15.50 to \$16; Gray Forge, \$15 to \$15.25; Tennessee and Alabama brands, No. 1 Foundry, \$16 to \$16.25; No. 2 Foundry, \$15.25 to \$15.75; No. 1 Soft, \$16 to \$16.25; No. 2 Soft, \$15.25 to \$15.50; No. 3 Foundry, \$14.75 to \$15; No. 4 Foundry, \$14.25 to \$14.50; Gray Forge, \$14.25 to \$14.50.

Cast Iron Pipe.—Only small orders, chiefly for New England municipalities, are now in the market. The Philadelphia order for about 9000 tons was divided between Eastern shops.

Steel Rails.—The Mexican orders have not been placed yet. One calls for 105,000 tons and the other for 35,000 tons. The domestic market is quiet, the Eastern mills being booked heavily for a long period. We continue to quote \$28 for Standard Rails at Eastern mill.

Finished Iron and Steel.—The largest contract closed in this district during the week was that for the Lift Bridge at Bridgeport, Conn. Prices are quoted as follows at tidewater: Beams, Channels and Zees, 1.75c. to 1.80c.; Angles, 1.75c. to 1.80c.; Tees, 1.80c. to 1.85c.; Bulb Angles and Deck Beams, 2c.; Sheared Steel Plates are 1.78c. to 1.85c. for Tank, 1.90c. to 1.95c. for Flange, 2c. to 2.05c. for Fire Box. Charcoal Iron Plates are held

at 2.40c. for C. H. No. 1, 2.90c. for Flange, and 3.40c. for Fire Box. Refined Bars are 1.65c.; Soft Steel Bars, 1.70c.

Metal Market.

NEW YORK, December 31, 1901.

Owing to the Christmas holidays abroad the London Metal Exchange was closed from Tuesday, the 24th, until Friday, the 27th inst. While the New York Metal Exchange closed only on Christmas Day, the absence of London quotations added to the naturally dull conditions, and until last Monday the market was stagnant.

Pig Tin.—Scarcely any business has been transacted and the market was exceedingly dull and uninteresting. Prices have recovered very slightly since the heavy break of a week ago. At the close to-day spot was quoted 23.50c. January quotations ranged between 23c. and 23.75c. February and March were quoted 23c. to 23.50c., and 22 1/2c. was bid for April and 23c. asked. London closed £106 5s. for spot and £104 5s. for futures. Arrivals this month amounted to 3202 tons, while deliveries were 3000 tons. Stocks aggregate 2331 tons.

Copper.—There is no basis of price. Nominally prices are unchanged, because the principal producers who have made the recent reductions are still quoting 13c. for Lake, 12 3/4c. for Electrolytic and 12 1/2c. for Casting. There are no buyers. As proof of this, Lake was offered this morning at 12 3/4c., but no one even answered with a bid. There is considerable rumor about heavy sales at low figures. These are simply the ordinary baseless rumors, however, as buyers are not taking the metal at any figure. There is a feeling in the trade that the first business day of next year will witness another cut in price. It is also the belief of the trade that the war has just commenced and, considering the strength of the contestants, it is held that it must be a bitter one. The heavy accumulation of Copper that has caused all the trouble will, of course, figure largely in the strife. One of the chief factors in the struggle stated this morning that cost of production could be considered as the only level of values; and, said he, "we can produce as cheaply as any one else in the business." He added significantly, "We can also use the big stock that every one has been talking about, and which we can afford to give away." There has been a good deal of talk about enormous rebates that the Calumet & Hecla interests will have to allow, owing to the decline in price. As a matter of fact, there will be no rebates necessary, as the company only guaranteed their own price. It is thought, however, that the company will not force deliveries upon their old customers, however, in order to retain their good will. London has stiffened a shade, prices to-day being £49 for spot and £49 10s. for futures. Best Selected has advanced £1 to £57.

Pig Lead.—Since the decline in price there has been practically no business transacted. Consumers are taking the same stand as the consumers of Copper have held for some time. They are not buying in advance. They are also asking merchants and brokers to guarantee their prices, but are meeting with no success in this respect. Consequently there is a standstill in business. The American Smelting & Refining Company still quote Desilverized 4c., New York, and 3.95c., St. Louis. London remains unchanged at £10 3s. 9d.

Spelter.—This metal is also a drug on the market. There is practically no business and prices have eased off somewhat. Spot is nominally 4.25c. to 4.30c., New York, while St. Louis advises quote 4.12c. London is down to £16 15s.

Antimony.—Is unchanged, Hallett's being quoted at 8 1/4c., Cookson's 10 1/4c., and outside brands 8c.

Nickel.—Is unchanged, contract prices continuing on a basis of 60c.

Quicksilver.—No change has taken place, demand being rather slack, with prices on a basis of \$51 per flask of 76 1/2 lbs. in lots of 50 flasks or more. London is quoted £8 17s. 6d.

Tin Plates.—The American Tin Plate Company continue to sell for the first quarter of next year on a basis of \$4.19 per box of standard 100-lb. Cokes, f.o.b. New York, and \$4 f.o.b. mills. Business is fair and the market contains no interesting features.

The New York Machinery Market.

NEW YORK, December 31, 1901.

Practically the whole story of the New York machinery trade of 1901 has been told. In the 51 previous reports the important features of the market were outlined. Little remains to be said on this, the last day of the closing week of the year. Although there was nothing of great importance to mark the exit of 1901, the week was by no means entirely devoid of business. In fact, it was an exceptionally good week as end of the year weeks go. There was a nice volume of little business. Orders for one or two machines were sufficiently numerous to keep merchants fairly busy and remind them of the fact that the old year was not dying without a struggle. Inquiry was also comparatively good. Everything tended to strengthen the belief that the new year will open under most gratifying auspices.

A fair sized inquiry for machine tools has just come to our notice from the South.

The American Machine Company, 524-532 East Main street, Louisville, Ky., advise us that, exclusive of boiler, engine, one special 72-inch Niles full universal radial drill and one 72-inch Niles horizontal boring and turning mill, which have been purchased, they would be pleased to receive quotations from manufacturers for the following equipment for their new plant now in course of erection at Jackson and Main streets: Power traveling cranes, jib cranes, one key seat slotting machine, several small drill presses and several small lathes, to be installed in the machine shop; hand traveling and jib cranes, one steam hammer, bolt threading machine, punch and shears, bending rolls and blast fan, to be driven by electric motor, to be installed in smith shop; power traveling crane, cupola with capacity of 5 tons, blast fan and casting mill, to be installed in foundry; planer, jointer, cross and rip saws, boring and tenon machine, band saw and wood lathes, to be installed in wood shop; equipment for heating entire plant by steam, and electric light plant direct connected of about 20 k.w. and 110 volts capacity. The plant will be operated by one Huston, Stanwood & Gamble 75 horse-power engine and one 100 horse-power horizontal tubular boiler. The dimensions of the different shops are: Machine shop, 50 x 150 feet, of brick and steel, with cast iron interior and gravel roof, two stories; smith shop, 25 x 75 feet, of brick and steel, with cast iron interior, one story; foundry, 45 x 150 feet, of brick and steel, with cast iron interior and gravel roof, one story; wood shop, 68 x 100 feet, of brick, with wood interior and tin roof, two and one-half stories.

There was a little comment in the trade in connection with the reporting of a new incorporation, which filed a charter in New Jersey recently. It is known as the Bourne Company, and has a capital of \$100,000. Among the incorporators are named Frederick G. Bourne, William F. Proctor, Douglas Alexander and Theodore E. Hardenburg, all of whom are connected with the Singer Mfg. Company of Elizabethport, N. J. Lebbeuse B. Miller, the general superintendent of the Singer Works, is named as the company's agent. An official of the new company informed a representative of *The Iron Age* that the new concern would not go into manufacturing at present. He said that it was found that the business of the Singer could be facilitated by the aid of another corporation. The objects of the company are to buy, sell and manufacture sewing machines. At present the concern will only buy and sell.

It is likely that a new automobile plant will be erected in Elizabethport, N. J., to replace the Riker Motor Vehicle Company plant, which has been removed to Hartford, Conn. A. L. Riker, First Vice-President Byllesby, Chief Engineer Whiting and Chief Constructor Sammis of the company have resigned. These gentlemen opposed the removing of the works, but when their opposition was of no effect they withdrew from the concern. Mr. Riker is said to still hold the principal patents covering the Riker vehicle. While no announcement has been made as yet, it is stated in the trade that a new company will be organized and new works built.

A report which is being carefully followed in the trade is to the effect that the Pennsylvania Railroad Company

are to build an immense car wheel plant at Altoona, Pa. A large tract of land has been purchased adjoining the car shops, and it is stated that the new plant will cost approximately \$1,000,000.

Local press reports to the effect that E. W. Bliss had purchased property on East Twenty-third street, New York, and would erect a ten-story factory building caused considerable comment in the trade. It was at first taken that the E. W. Bliss Company of Brooklyn had some new project in contemplation. Mr. Bliss informs us, however, that, having property on Twenty-second and Twenty-third streets and Second avenue, he intends building a ten-story factory structure for rental. The enterprise will in no way be connected with the E. W. Bliss Company. In the new building there will be a power plant not only large enough to supply the requisite electric current for use in it, but also of sufficient size to drive all of the machinery in adjoining buildings owned by Mr. Bliss. This will do away with two existing steam plants.

The Navy Department has called for bids, to be opened January 14, for furnishing the following supplies for the Puget Sound Navy Yard: For the installation of a steam heating system in the general storehouse; one locomotive steam crane; one 5 horse-power motor; one stationary stop engine, with automatic governor; one back geared screw cutting engine lathe; modern tool room lathe, with compound rest and taper attached; one 16-inch triple quick return crank shaper; one 2½-inch combination radial drill; one combination punch and sheathing machine; one 14-inch sensitive drill, with square and box tables; one power grindstone complete, with stone dressing attachment; one bench emery grinder; one twist drill grinder for grinding drills from ¼ to 2¼ inches.

A number of machine tools and a steam winch are included in the supplies to be purchased for the Mare Island Navy Yard, under bids to be opened on January 14.

G. W. Subette, city engineer of Minneapolis, Minn., will receive bids until January 31 for furnishing boilers and traveling crane for the two 15,000,000-gallon pumping engines.

Bids are wanted until January 21 for furnishing and erecting in the Brilliant pumping station, Pittsburgh, two compound condensing high duty pumping engines; also in the Herron Hill pumping station one triple compound condensing high duty pumping engine. J. Guy McCandless, director Department of Public Works.

Proposals will be received at the Bureau of Yards and Docks, Navy Department, Washington, until February 15 for constructing a coal storage and handling plant at the Navy Yard, Bremerton, Wash. Plans and specifications can be seen at the Navy Yard named or will be furnished by the Bureau. Mordecai T. Endicott, Chief of Bureau.

On January 1, 1902, the Bullock Electric Mfg. Company of Cincinnati and the Wagner Electric Mfg. Company of St. Louis will establish a Foreign Sales Department, with headquarters at Cincinnati. Hereafter all foreign business, except in Mexico and Canada, for the two companies will be handled by this new department, which will be under the management of Frank G. Bolles. The work of the Advance Department will continue under the direction of Mr. Bolles, under whose charge it has been for the past three years.

Formal announcement to the trade was made by Browne & Frothingham of 32 Broadway of their opening of a department for the export of machine tools. This department will be under the supervision of A. M. Fisher, who has just returned to New York after three years spent in Japan, where his entire attention was devoted to this branch of engineering. Catalogues and prices, together with shipping weights and measurements are solicited from the machine tool builders of the United States. Correspondence is desired with the purchasers of machine tools in foreign countries.

Cleaver Brothers have established themselves as mechanical, civil and sanitary engineers at 189 Montague street, Brooklyn, N. Y. C. E. Cleaver and P. J. Cleaver comprise the firm. They have had experience in the erec-

tion of steel and masonry buildings, heavy foundations, piers, railroads, &c., in the employ of the Navy Department.

Wireless Telegraphy.

Arthur V. Abbott, in an article published in the *Electrical World*, takes up the question:

But what is the actual *status quo* of wireless telegraphy as a commercial art, and what are the probabilities for the future? Both in this country and in Europe, Mr. Marconi has demonstrated that readable signals may be sent over a space of nearly 100 miles. Other experimenters have confirmed these results. The apparatus is easily manipulated, is reliable, does not require extraordinary skill to operate, and is not excessively expensive in cost of construction. As yet the range is limited to 100 miles, nor has more than a third of this distance ever been covered, excepting at sea, for it is curious to note that all attempts on land have so far been failures when pushed over a space exceeding a few miles. The squadrons of the world have proven the possibility of signaling under all conditions of naval maneuvers, and there are several experimental stations at work at sundry points on the English coast with apparent success. But when the records are examined for reports as to commercial business and when one looks for the number of instruments operated for revenue and the returns therefrom, not a single instance is to be found. The African War would seem to have presented a peculiarly attractive opportunity to demonstrate the value of Hertzian telegraphy. Instruments and operators were shipped to the front, but not a message was transmitted, because, forsooth, no masts were included in the outfit, and it was alleged that the African meteorological conditions were so anti-British that when there was wind enough to fly a kite at one station there was none at the other, some 30 miles away. Meanwhile an old fashioned rival of wireless telegraphy (the heliograph) flashed its nightly tidings during all the weary months of the siege of Ladysmith.

As the transmitting station is the center of a spherical wave, it follows that a receiver located at any point on the successive surfaces as the wave progresses may be affected. This fact has been urged as a serious objection to radiant telegraphy, as secrecy is impossible. For this reason it is doubtless somewhat easier to obtain a knowledge of wireless signals than those transmitted by other methods, but saving the use of a cipher, there is no method of telegraphing or telephoning with which an expert eavesdropper cannot readily become acquainted, and cryptographers are always busy inventing new codes to replace those which their equally ingenious and too curious opponents have deciphered. A much more serious consequence of the spherical wave is the enormous expenditure of energy in proportion to the effect on the receiver. When it is remembered that the energy at the emitting station must vary as the square of twice the distance between the oscillator and coherer, the glibness with which the ease of signaling from London to New York is discussed, recalls the Solomonic aphorism regarding "He that answereth a matter before he heareth it." Further, as the radiation from any source may impinge upon any receiver located within the sphere of its influence, a hostile transmitter may be easily operated and the injection of a few meaningless symbols throw into hopeless confusion all of the receivers in its neighborhood. In point of speed Hertzian telegraphy again finds itself sadly handicapped. Even in expert hands it is slow in comparison with other methods. The sending key must transmit the heavy currents needed to excite a powerful induction coil; there is also the inertia of the oscillator and sluggishness of the coherer and decohering mechanism, so a dozen or fifteen words per minute becomes phenomenal, and on the average rarely more than eight or ten are achieved. Mr. Gradgrind would probably summarize the present condition of wireless telegraphy something as follows: A limit of 100 miles at sea and one-third of that on land. The impossibility of secrecy excepting by code. The impossibility of operating more than one station simultaneously within the limits of a single receiver. The helplessness of the receiver when subjected to hostile radia-

tion. The probable average speed of less than a dozen words per minute, with the expenditure of an enormous amount of energy. To offset, there is only the saving in the cost of line construction between the two stations, which ordinarily would be cheap in comparison with the royalty which the owners of the Marconi patents are rumored to charge.

But what of the future? Wireless telegraphy is only a few years old and in the natural course of evolution may develop as usefully as the telegraph or telephone. As electric waves differ only in speed and amplitude from others, they obey the same laws of reflection and refraction. Therefore it should be possible to concentrate them and produce an electric beam by means of proper mirrors or lenses, in the same manner as a search light ray is obtained. It seems possible that the circuits in the receivers and oscillators could be so adjusted that they should only mutually respond to each other like a pair of sympathetic tuning forks. Theoretically all this is within the nature of things, and if achieved would go far toward removing the present impracticabilities. Mr. Marconi claims, it is said, to have solved these problems and to have produced a syntonic receiver and transmitter that only respond to the particular waves emitted by the one and that are intended for the other. He also, it is claimed, has produced a projecting apparatus that emits a well defined electric beam, and has replaced the vertical receiving masts by an equally efficient and more compact collecting cylinder. As yet, however, these are nothing but the merest rumors, unless a very indefinite letter from Professor Fleming may be regarded as confirmatory evidence. Possibly the first year of the new century will reveal some discovery that may be a panacea for all of the "ills which Hertzian signaling is heir to," but from the cold and calm standpoint of present facts the way appears to be tedious, the road hard and difficult and the goal a long way in the future.

The Consolidation of Pneumatic Tool Interests.

With a capital of \$7,500,000 the Chicago Pneumatic Tool Company were incorporated in New Jersey last Saturday. At present the officers of the company are in Chicago perfecting the details of the consolidation. No official statement has been made since the incorporation of the company. As previously stated in *The Iron Age*, the new company will amalgamate the interests of the former Chicago Pneumatic Tool Company, the Franklin Air Compressor Company, the Bozer Machine Company, the Chisholm & Moore Mfg. Company and the Tate-Howard Company of Manchester, England. The incorporators of the new company are Clifford W. Perkins, K. K. McLaren and L. I. Bailey.

Ralph L. Morgan, son of Charles H. Morgan of the Morgan Construction and Morgan Spring companies, and now with the American Bicycle Company, has been granted a patent for a vehicle adapted to automobile purposes. The claim is for combination of a frame; a front axle transversely pivoted thereto, so as to be free to turn upon a transverse, central horizontal axis, and side bars and thrust bars extending from the front to the rear axles, and arranged so as not to interfere with the turning of the front axle, or its central horizontal transverse pivot. The patent is assigned to Charles R. Flint of New York.

All previous season records for iron ore receipts at any one harbor in the world have been broken by Ashtabula. According to the Marine report just completed the ore received during the season just past aggregates 4,477,000 tons. Ashtabula's ore receipts in 1900 were 3,717,128 tons, the largest season's receipts up to that time in the history of any port. Coal shipments from Ashtabula during 1901 were 1,484,335 tons, against 1,593,225 tons the year before.

Edward S. Hutchinson, chief drafting engineer of the Bath Iron Works, Bath, Maine, died on December 25 from nervous prostration, aged 35 years. He was born in Providence, R. I., and graduated from the Massachusetts Institute of Technology.

A Census Report on Industrial Consolidations.

WASHINGTON, D. C., December 31, 1901.—An interesting bulletin has been prepared by the Census Office on the subject of industrial combinations, in which, as would naturally be expected, the iron and steel group appears at the head of the list, both with reference to capital invested and value of output. As the statistics were originally designed to cover conditions as they existed during the census year ending May 31, 1900, a number of important combinations are omitted from the official summaries, but in the case of the United States Steel Corporation, for example, a separate table is supplied showing their constituent companies, their capitalization, &c., while in the official summary such of the constituent companies as were in existence May 31, 1900, are also included. The following are the features of special interest to readers of *The Iron Age*:

"Some misconception exists as to what constitutes 'an industrial combination,' and it was necessary in order to obtain a uniform basis of tabulation to fix a definition which should limit and designate the corporations to be included. The following definition was therefore formulated:

"For the purpose of the census the rule has been adopted to consider no aggregation of mills an industrial combination unless it consists of a number of formerly independent mills which have been brought together into one company under a charter obtained for that purpose. We therefore exclude from this category many large establishments comprising a number of mills which have grown up, not by combinations with other mills, but by the erection of new plants or the purchase of old ones."

"The word 'trust' was avoided in this definition, because, while it may have come to convey to the popular mind a definite significance, it stands technically for a form of organization under which the stockholders of each of the separate companies assign their stock to a certain number of trustees, thus giving to these trustees an irrevocable power of attorney to vote the stock as they see fit. This form of organization has been declared illegal by the act of July 2, 1890, Fifty-first Congress, first session, entitled 'An act to protect trade and commerce against unlawful restraint of monopolies,' 26 Statutes at large, page 209, and by the statutes of many States.

"This definition excludes from the category of industrial combinations a number of corporations which are commonly considered as such combinations because they represent enormous aggregations of capital or control a large number of plants. Some of these large establishments are not incorporated, and many of them arose from very small beginnings and have increased from time to time by the construction of new mills or by the purchase and rehabilitation of other plants, not through any method of combination or consolidation or any change in the previous management.

"In order to avoid any misunderstanding as to the corporations included by this office in the groups of industrial combinations there is here presented a list giving the names of these corporations, together with certain other data. The list contains the names of 183 corporations, controlling 2029 plants that were active during the census year, and also 174 plants that were reported as idle during that period, showing an average of 11 active plants to each corporation. The corporations embraced under the three heads—1, iron and steel and their products; 2, metals and metal products other than iron and steel, and, 3, vehicles for land transportation, &c.—are as follows:

Iron and Steel and Their Products.

Name of combination.	No. of plants controlled.	Capitalization.
Alabama Consolidated Coal & Iron Company	4	\$5,000,000
American Axe & Tool Company	6	22,000,000
American Bridge Company	24	70,000,000
American Iron & Steel Mfg. Company	5	20,000,000
American Ordnance Company	2	2,500,000
American Radiator Company	9	10,000,000
American Sheet Steel Company	29	53,000,000

American Steel & Wire Company of New Jersey	42	90,000,000
American Tin Plate Company	65	50,000,000
American Wood Working Machine Company	8	4,000,000
Atlas Tack Company	4	700,000
Central Foundry Company	14	14,000,000
Continental Gin Company	6	3,000,000
Empire Steel & Iron Company	10	5,000,000
Federal Steel Company	17	200,000,000
Herring-Hall Marvin Company	2	3,300,000
International Heater Company	2	1,800,000
International Power Company	2	8,000,000
International Steam Pump Company	6	27,500,000
National Enameling & Stamping Company	10	30,000,000
National Malleable Casting Company	4	3,000,000
National Saw Company	4	1,000,000
National Shear Company	3	3,000,000
National Steel Company	22	59,000,000
National Tube Company	26	80,000,000
Niles-Bement-Pond Company	4	8,000,000
Ohio Tool Company of Auburn, N. Y.	2	350,000
Otis Elevator Company	6	11,000,000
Pittsburgh Stove & Range Company	8	2,000,000
Republic Iron & Steel Company	35	55,000,000
Shelby Steel Tube Company	14	15,000,000
Standard Chain Company	11	3,000,000
Steel Tired Wheel Company	5	4,000,000
Susquehanna Iron & Steel Company	7	1,500,000
United Shoe Machinery Company	5	25,000,000
United States Cast Iron Pipe & Foundry Company	17	30,000,000
Virginia Iron, Coal & Coke Company	21	10,000,000
Wheeling Steel & Iron Company	7	5,000,000
American Steel Casting Company	6	4,200,000
American Steel Hoop Company	15	33,000,000
Total	489	\$952,850,000

Metal and Metal Products Other than Iron and Steel.

Name of combination.	No. of plants controlled.	Capitalization.
Amalgamated Copper Company	4	\$75,000,000
American Brass Company	4	20,000,000
American Shot & Lead Company	12	3,000,000
American Smelting & Refining Company	18	65,000,000
American Type Founders' Company	12	4,000,000
Cherokee-Lanyon Spelter Company	14	600,000
International Silver Company	13	20,000,000
Magnus Metal Company	5	3,000,000
National Lead Company	17	30,000,000
New Jersey Zinc Company	8	10,000,000
Standard Sanitary Mfg. Company	6	5,000,000
Total	113	\$235,600,000

Vehicles for Land Transportation.

American Bicycle Company	35	\$30,000,000
American Car & Foundry Company	17	60,000,000
Pressed Steel Car Company	4	25,000,000
The Pullman Company	5	74,000,000
Standard Wheel Company	6	1,000,000
Southern Car & Foundry Company	5	3,000,000
Total	72	\$193,000,000

"In order that each branch of manufacturing industry may receive its proper credit it has been found necessary, in some cases, to secure from companies engaged in the manufacture of two or more classes of products of a different nature a separate report for each. This is particularly true in the case of iron and steel manufacture, in which industry separate returns were required for the blast furnaces, rolling mills, pipe works, tin dipping plants, foundries and machine shops and other branches. These will also appear in the statistics of manufactures as separate and distinct plants, although the operations of all may really be carried on under one roof, and are generally considered as one establishment. This will account for what appears to be an excess in the number of plants accredited to the American Tin Plate Company and others of the large iron and steel corporations. The American Tin Plate Company operate 34 rolling mills for the production of iron and steel sheets, and in connection with these they also operate 31 tin dipping plants, making, in all, 65 plants. Although these apparent duplications occur principally in the iron and steel industry, there are a number of such instances in other groups, chief among which is that of the National Lead Company, in the group of 'metals and metal products other than iron and steel.' The nature of the products of this company made it necessary to secure several separate reports from some of the establishments controlled, thus making the total number of plants appear to exceed what is usually accredited to the company.

"Since it is impossible to present the figures for each industrial combination separately without violating the pledge of the Census Office that no publication of these statistics of manufactures will be made which will reveal the details of private business, the reports for the different plants were assigned to generic groups of industries according to their products of chief value. The figures for the iron and steel group are given as follows:

"Number of combinations, 40; number of plants, 447;

capital, \$341,779,954; number of officials, 6075; salaries paid, \$7,462,386; average number of wage earners, 145,609; wages paid, \$81,098,583; miscellaneous expenses, \$18,067,249; cost of materials used \$325,630,784; value of products, \$508,626,482.

"The statistics covering metals and metal products other than iron and steel are as follows:

"Number of combinations, 11; number of plants, 89; capital, \$118,519,401; number of officials, 1047; salaries paid, \$1,571,414; average number of wage earners, 20,522; wages paid, \$12,356,772; miscellaneous expenses, \$2,847,356; cost of materials used, \$131,020,638; value of products, \$180,154,703.

"The corresponding figures covering vehicles for land transportation are as follows:

"Number of combinations, 6; number of plants, 65; capital, \$85,965,683; number of officials, 1967; salaries paid, \$1,940,778; average number of wage earners, 34,422; wages paid, \$17,571,613; miscellaneous expenses, \$3,519,070; cost of materials used, \$56,600,518; value of products, \$85,985,533.

"It will be noted that the item of capital in the above summaries bears no relation to the stock issued or authorized, but is made up in the case of each combination of land, buildings, machinery, tools and implements, cash and sundries, and is denominated 'live' capital.

"The iron and steel industry is at the head, with a gross product of \$508,626,482, which is more than double the value of the product of any other group, except that of 'food and kindred products,' and represents nearly one-third of the total gross value of products of all the industrial combinations. The total value of all the products of the industrial combinations reported was \$1,661,295,364.

"The 183 corporations employed, on an average, 399,192 wage earners during the census year, the greatest number employed at any one time during that year being 508,193, and the least number, 333,164. To these employees the sum of \$194,534,715 was paid in wages. In addition to the wage earners, employment was given to 24,585 salaried officials, clerks, &c., to whom salaries amounting to \$32,653,628 were paid. There was expended by these industrial combinations for miscellaneous expenses a total of \$151,851,077, which was distributed among the several items. The total cost of materials utilized by industrial combinations was \$1,085,083,828. It is not to be assumed, however, that a combination of these figures of expenses subtracted from the total reported value of products is in any sense indicative of the profits in the manufacture of these products during the census year. The census schedule takes no cognizance of the cost of selling manufactured articles, or of interest on capital invested, or of mercantile losses incurred in the business, or of depreciation in plant. The value of the products given is the value as obtained or fixed at the shop or factory. This statement is necessary in order to avoid erroneous conclusions from the figures presented.

"The value of the products given for all the industrial combinations, \$1,661,295,364, is the gross value, and not the net or true value. The difference between these two should be carefully noted. The gross value is found by adding the value of products in the separate establishments. But the finished product of one establishment is often the raw material for another. In such cases the value of the former reappears in the latter, and thus the original cost of certain materials may be included several times in the gross value. The net or true value is found by subtracting from the gross value the value of all materials purchased in a partly manufactured form. In this way the duplications in the gross value are eliminated."

The statistics given in the bulletin with regard to the United States Steel Corporation embrace simply the enumeration of the constituent companies with their stock and bonds authorized and issued. W. L. C.

To Settle Upon Price of Brass.

A conference of the principal manufacturers of Brass is scheduled to take place in New York on January 2. It is believed that a reduction of the price of Brass will

be decided upon. Since the last meeting of the producers of the yellow composition prices of Copper have been further reduced. It is now considered advisable for trade purposes to make some concessions in the price. As the price of Brass has relatively been considerably lower than the price of Copper it is not believed that the contemplated reduction will be very heavy.

Iron and Industrial Stocks.

The week under review has been one of advancing prices, generally speaking. The Car and Foundry issues, International Pump, Pressed Steel Car, Republic Iron & Steel, Tennessee and United States Steel issues all have gained somewhat. It is noted, too, that some of the long neglected stocks, like Virginia Coal, Iron & Coke and Cast Iron Pipe have attracted more interest and show improvement. There has been somewhat of a rally, too, in American Car Company issues.

Dividends.—The Pittsburgh Plate Glass Company have declared the regular quarterly dividend of 1½ per cent., payable December 31.

The Westinghouse Electric & Mfg. Company have declared the regular quarterly dividend of 1¼ per cent. on the first preferred stock.

The E. W. Bliss Company have declared a quarterly dividend of 2½ per cent. on their common stock, and 2 per cent. on their preferred stock, payable January 2.

The Lackawanna Company Buys Mining Property.

—The Lackawanna Iron & Steel Company have purchased the Sherman interest in the mines, railroad property and furnace of Witherbee, Sherman & Co., at Port Henry, N. Y. The members of the Sherman family, George D. Sherman, George K. Sherman and John R. Sherman, held a third interest, the balance being controlled by Frank S. Witherbee, Walter C. Witherbee and Wallace E. Foote, Jr. The company own the famous ore property on Lake Champlain, extensively developed, with a magnetic concentrating plant, now being doubled. The railroad from Mineville to Port Henry is owned jointly with the Port Henry Iron Ore Company. On Lake Champlain, Witherbee, Sherman & Co. possess very extensive ore dock property. Lately the company have made extensive shipments of ore, not alone to the furnaces on the Hudson River, to the Lehigh and Schuylkill Valley, but also to the Dominion Iron & Steel Company, at Sydney, N. B. By canal or by rail the Port Henry mines can ship cheaply to Buffalo, where the Lackawanna Iron & Steel Company are building a very large and comprehensive plant.

W. B. Scaife & Sons Company.—The firm of Wm. B. Scaife & Sons, at Pittsburgh, builders of steel frame buildings and heavy sheet and plate iron work, have been succeeded by Wm. B. Scaife & Sons Company, a corporation with a capital of \$850,000. The concern are one of the oldest doing business in Pittsburgh, having been originally established in that city in 1802. The original offices and works are on First avenue, Pittsburgh, but the new plant is at Oakmont, Pa., where it is intended to concentrate the offices and entire works. The plant at Oakmont will be very materially enlarged during the coming year on account of the heavy increase in the business of the concern.

The New Castle Steel Plant.—The New Castle Steel Works of the National Steel Company, at New Castle, Pa., are to be enlarged, and the present capacity will be increased one-third or more. The plant contains two 6-ton converters, and these will be taken out and larger vessels installed. It is intended to bring the capacity of the New Castle Works up to about 1000 tons per day. The principal output of the plant is sheet bars, and the works will close some time during February to install the new converters. John Reis is general superintendent.

McKeefrey & Co., manufacturers of pig iron, at Leontonia, Ohio, have recently bought some coal property, and will probably build some coke ovens.

TRADE ITEMS.

ON January 1 Buchanan-Foster Company, offices 724 Drexel Building, Philadelphia, Pa., succeeded Garrett-Buchanan Company in the Building and Roofing Paper business. The new company have purchased the mill and tar refinery at York Haven, Pa.

BEALL SHOVEL COMPANY, Alton, Ill., who started last August to make a full line of Cleveland or Open Back Shovels, Spades and Scoops, advise us that trade has increased to such an extent and they had such a demand for the Antrim pattern that they have decided to add this Shovel to their line.

THE J. D. WARREN MFG. COMPANY, Masonic Temple, Chicago, are favoring the trade with a holiday souvenir, consisting of a handsome memorandum book bound in pictorial celluloid covers. This memorandum book, in addition to furnishing ample room for notes, contains yearly calendars for 1902, 1903 and 1904, as well as a variety of practical information which will be appreciated by business men and the public generally. Attention is incidentally called to the Warren Hardware Shelving. The whole arrangement is exceedingly tasteful and creditable.

C. W. ALDRICH, Minneapolis, Minn., has accepted an engagement with the Home Stove Company, manufacturers of Model Stoves and Ranges, Indianapolis, Ind. Mr. Aldrich will travel through the Northwest, and his territory will extend down through Northern Missouri, including Kansas City. Mr. Aldrich is well known in the Stove and Hardware trade of the Northwest. The Home Stove Company have reached the eighth year of their existence and have in that time built up a large business in their specialties.

U. T. HUNGERFORD BRASS & COPPER COMPANY, 121 Worth street, New York, are notifying their customers by mail that owing to the unsettled condition of the Copper market it is hoped that purchases, until new prices are established, will not exceed actual requirements. They also suggest drawing on their stock in New York for current necessities, thus obviating future loss should a decline occur. By the same opportunity they state their stock of Brass, Copper, &c., in New York warehouse is in excess of 1,000,000 pounds, the leading items of which are mentioned by them.

THROUGH the efforts of J. M. Fraga, manager of the Norway Tack Company, Norristown, Pa., an error which has existed for some time in the rates of the Southern classification has been corrected. The correction has reference to Brass Washed Goods, which have heretofore been classified under second-class matter, thus taking the same rating as genuine Brass Goods. They now take the same classification as the regular black corresponding goods. In other words, if they are Tacks they take fourth class rate, and if Nails, sixth class rate.

S. R. KIRKNESS of J. C. Plimpton & Co., import and export American merchants, Plimpton's Buildings, Old Hall street, Liverpool, England, intends visiting the United States early in January for the purpose of arranging contracts for 1902 supplies. The house are also desirous of obtaining additional agencies, and Mr. Kirkness will be prepared to negotiate for new representations. Those who desire to communicate with Mr. Kirkness may address him care of G. A. Plimpton, 70 Fifth avenue, New York.

RICHARD B. SHERMAN, who for many years has been in charge of an important department of the business of Manning, Maxwell & Moore, 85-89 Liberty street, New York, has recently identified himself with the J. Edward Ogden Company, 147-149 Cedar street, New York, dealers in Heavy Hardware, where he will be pleased to receive his friends.

Charles B. Hart and Frank T. Ward, trading as Julius Lewis Hardware Company, Raleigh, N. C., have incorporated their business under the style of Hart-Ward Hardware Company. The new company will assume all assets and liabilities of their predecessors.

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HARDWARE.

THE HARDWARE TRADE IN 1901.

With the opening of 1902 all classes of the Hardware trade can unite in mutual congratulations on the general features of business during the past year. Beginning with a tone that was not overconfident, but with general conditions that promised well, the course of trade was such as to dispel any apprehensions that existed and justify the expectations of an exceptionally satisfactory year, in the activities of which both manufacturers and merchants have participated. The demand made upon the manufacturers has been steady and in some lines so heavy that the supply has been inadequate, and the problem with merchants has been to obtain goods with sufficient promptness to meet the requirements of their customers. It was an easy year in which to sell goods, and under these conditions business has naturally been on a profitable basis. There was comparatively little speculation in buying, although those who were able to anticipate the course of things, and especially the strength which was developed in certain lines, reaped more than the average share of advantage, as they were not infrequently in a position to anticipate their wants more freely than would otherwise have been the case. The year has, on the whole, been a memorable one in other respects besides the volume of business and the profit with which it was transacted.

Manufacturers for one thing have learned to be more independent than in former years, and have as a rule been guarding themselves against one sided contracts in which nearly all the advantage was with the purchaser, against the evils of guaranteeing prices, and against the pressure of buyers for extra discounts, which sometimes crowded the cost line. The strength of the market and the feeling that goods could be disposed of, possibly at higher prices, made the manufacturers more confident in marketing their products and less anxious to book orders for future delivery. There was, too, on the part of manufacturers generally, a feeling of better business methods. The organization of large consolidations had something to do with this, inasmuch as those large companies are generally characterized by excellent management and have sufficient strength to resist pressure brought to bear on them to conform to unbusinesslike usages which have for years been too characteristic of the trade. Examples of splendid business management have always been found among Hardware manufacturers, but there has often been with others a lamentable deficiency in this respect. The past year has witnessed a marked improvement in this direction. It is hoped that the tendency will be continued during the year on which we have entered.

The department store and the catalogue house continue to command the attention of the trade, as they are a constant, and, in some sections, a troublesome form of competition. The associations of both jobbers and retailers recognize the situation, but are at a loss as to the measures to be taken to correct the evil or to check the tendency. An important event during the year was the failure of a large Western catalogue house which had for years been a source of great annoyance both to wholesale merchants and retail dealers, as such houses cultivate a trade with consumers, thus injuring the business of retail merchants and diminishing the

trade which they would otherwise have given to the jobbers constituting their regular source of supply. The manner in which this kind of competition is to be opposed, and the extent to which merchants may learn from or possibly imitate its methods, are questions which still await settlement.

The great activity in the Hardware trade the past year has had important results in expanding jobbing interests at many points. This is illustrated in the growing importance of Duluth and the development of the jobbing trade in the West and Northwest generally, where many of the leading houses have enlarged their facilities. This is naturally the result of the existing prosperity, which causes growth in every healthy enterprise. The large establishments have not fattened, however, at the expense of the smaller ones, but the latter have likewise reaped a good share of the growth of the Hardware trade. The small jobbing houses which have been established at so many points in all parts of the country to serve the convenience of local dealers are increasing in importance, and their number is constantly being enlarged by the entrance into the wholesale field of establishments which had previously been devoted exclusively to the retail trade. This is a marked tendency of the times. It has been found profitable for the larger retail merchants to enter the ranks of the wholesale trade and employ traveling men to solicit business from smaller retailers located in their vicinity. This not only enables the house establishing a wholesale department to secure better prices from manufacturers, but it also proves a great convenience to small retail merchants, who are thus enabled to secure more prompt delivery of goods urgently needed, as they can draw them from stocks in their immediate vicinity. This feature in trade is not confined to the more remote sections, but has also developed in the cities where the larger retail houses have found it practicable to cultivate a wholesale trade.

Condition of Trade.

It is seldom the privilege of an observer of trade conditions to chronicle a more gratifying report than is called for at this time, when there is on the one hand the record of an exceptionally successful year, and on the other a hopeful looking forward to a continuance of existing prosperity. It will be noted that in almost every line sanguine expectations are expressed of a large volume of business the coming year and under conditions which should make it profitable to both merchants and manufacturers. The trade in most leading lines has been such as to reduce to moderate size the stocks of manufacturers and merchants. In fact, in not a few lines it is still difficult to keep up sufficient assortment to meet the needs of the trade. The trouble begins with the manufacturer, who often finds it hard to get material for his goods, and it passes down through the trade, making it incumbent for buyers to do a good deal in the way of hurrying shipments. Prices generally are very firm. The conditions which exist, both at home and abroad, encourage the expectation of a large volume of business during 1902. This seems assured unless some disturbing influence, of which there is no indication, unsettles the situation and induces some element of perplexity or alarm. Thus the old year has closed with a memorable record and the new opens with bright prospects, which we trust will be amply realized by the readers of *The Iron Age*, who occupy so prominent and re-

sponsible a position as representatives of the great Iron and Hardware interests and leaders in the industrial and commercial development of the country.

Chicago.

(By Telegraph.)

The Hardware trade is now interrupted by the necessity of taking inventory. This has checked orders to some extent, but not so much as to cause dullness. The tide of business is running in such a flood that nothing seems to be effectual in stopping it. The leading jobbers take a most encouraging view of the outlook for the coming year. They are of the opinion that, considering the low stocks now held by the trade and the difficulty of securing material to adequately supply manufacturers, together with the fine financial condition of retail dealers and their customers throughout the West, the next three or four months are likely to make the question of getting goods more important than the prices asked for them.

Boston.

BIGELOW & DOWSE COMPANY.—Before your next issue the year 1901 will have been closed, whether for the good or for the bad. According to one's success or failure he will judge it. Unlike several of the years preceding, it has been uneventful, except that the large combinations of power and capital have had another year's trial, and the trade have had further experience to judge of their good or bad influence.

Competitive manufacturers have increased their output, and have sought diligently for trade, which must naturally be taken from their powerful antagonists. Fighting for another's customers causes demoralization and distrust, which is not usually confined to one class of manufacturers, but is liable to extend to the whole market.

That the sales departments of some of the large consolidations have used their power to prevent demoralization and to support the market is a matter of commendation, and should secure the support and thanks of the whole trade. The policy they have adopted the past year has been broad and liberal, and has prevented heavy declines that might have taken place in many leading lines had they not given them their support. The past year has demonstrated the fact that consolidation properly managed is a benefit and should receive the hearty and full support of the whole trade.

Staple and firm prices are much better for the trade than irregular and demoralizing ones. With the consolidations we may hope to keep the market on an even keel with fair prices; without them we may return to the old time chaos.

In 1900 the heavy declines in merchandise played havoc with the profits. In 1901 the return to normal conditions and an even range of prices should make a good showing of profits.

There has been a continued confidence in the market all the year. This has influenced good buying, and there are few businesses which will not show an increase.

Stock in the hands of dealers is light. Manufacturers' sales have depleted their surplus stock. Raw material is scarce and high. Goods being made for the coming year are made from the high priced stock. With these conditions ruling throughout the country it would seem that present prices might continue for the first half of the coming year. When declines do come if they come gradually, the trade are on the watch and do not suffer badly.

The sale of Skates has been better than for many years. The sale of Sleds and other seasonable goods has been abnormal.

The various manufacturing interests throughout New England are all in operation and labor is fully employed.

The seasonable weather allows the woodman free scope to operate in the woods and the ice harvest will be large.

Everything looks prosperous for 1902.

Although *The Iron Age* in its editorials the past year has seemed not to fully appreciate the absolute necessity of the wholesale dealers to the success of the retailers, it is hoped you will in the near future appreciate the error

of your conclusions, as we all wish your help and influence.

You certainly have our thanks for the good work done in the past and our best wishes for your future success.

Nashville.

THE GRAY & DUDLEY HARDWARE COMPANY.—It is very doubtful if so general a feeling of satisfaction has ever been experienced at the closing of the year's business as is felt at present. This feeling is, no doubt, augmented by the general confidence and hopefulness in regard to the future. Aside from the evil of too sharp competition, the jobbers have no cause for complaint, but rather for congratulation.

The retailers have enjoyed a good trade, made money, have fine prospects for the future, and are happy. As for the manufacturers, they have simply had a "plum good thing," of which we should not envy them, as their superior wisdom in marketing their products was largely instrumental in bringing about the present satisfactory market conditions. No, it is not the disposition of the jobbers to "muzzle the mouth of the ox that tread out the corn." The manufacturers as a class have shown us much consideration, and we wish them continued prosperity.

Some sections of our country did not make good crops, but the wave of prosperity has covered our country so completely that even the stricken localities are benefited very materially. The advance in the price of cotton has had a good effect on both trade and collections in the cotton district.

We have noticed from reading the daily papers that there has been a general scarcity of freight cars, and our city has been no exception to the general rule. In fact, we have been placed in a peculiarly unfortunate position, on account of the city having outgrown its railroad facilities. From this position we will be relieved within the next 30 days. Col. Jere Baxter will reach this city with his Tennessee Central Railroad, giving us a new independent line to the East. Colonel Baxter has been engaged for eight years in the construction of this road, and its completion to Nashville from the East is an event of unusual importance, and it will be built at once to the Mississippi River on the west, for which purpose our city contributes \$1,000,000. The Louisville & Nashville Railroad Company and the Nashville, Chattanooga & St. Louis Railroad have just completed new freight depots, equipped with all modern improvements and conveniences for handling freight, and with these improvements the freight situation at Nashville will be completely relieved, and we can reasonably expect our town to make some rapid strides in commercial progress. Real estate is advancing, and there are evidences of prosperity on every hand.

The greatest favor that the Hardware jobber in this city is inclined to ask of Santa Claus is simply to place in his stocking a guarantee that 1902 will be as good a business year as 1901 has been, and we have not lost faith in the generosity of our old time friend. We wish all of the good readers of *The Iron Age* the compliments of the season, and trust that the editors and managers will continue to be blessed with a long subscription list and full columns of advertising.

Baltimore.

CARLIN & FULTON.—While January 1 records simply a date arrived at, just as a milestone measures distance traveled, we must not consider that there is an interval between the year ended and the one begun, or that as between the old of yesterday and the new of to-day the contrast is such as to excite comment; on the contrary, the schemes and the plans, the hopes and the prophecies of the last 12 months find their realization in those which follow. It is well, however, to consider what those expectations are and the possibilities of their realization.

We in the Hardware trade have seen during the year 1901 possibly the highest development of the syndicate, the trust or the consolidation, by whatever name it may be called, and we have also seen the accumulated wealth of a great though young nation withdrawn from its local investments and hiding places and converted into the securities of great industrial combinations.

As to whether speculations in such stocks have proved remunerative to the investors we do not wish to discuss, but we are interested in the working out of the plans and methods of these great corporations in their efforts to earn the dividends necessary to maintain the market value of the stocks held so largely by the American nation.

In the production of iron and steel is one organization the marvel of the world, whose organization and management must surely be the perfection of business ability when we consider that for the first half of 1901 its net earnings were only \$15,000,000 less than the total net dividends for a whole year of the entire national banking system of the United States, and should the last six months of the year show as good results its total annual earnings would largely exceed those of the entire banking system of this country! The confidence of the public in this organization has surely been well deserved, judging from the life of the corporation so far, but all trusts or combinations cannot show the same satisfactory results to their stockholders.

One year ago it looked as though with the immense aggregation of capital in the hands of one combination there would be no room or opportunity for any outside or independent concern, and that it would require wonderful nerve on the part of any capitalist to undertake to compete, but during the year we have seen a number of corporations spring into existence, and though of limited capital as compared with the one whom they antagonize, their influence has been such that though the market for raw material is nearly 50 per cent. higher than one year ago the market price for their manufactured products has steadily declined.

We have seen also during the present year the Steel Goods Association dissolve, and the lowest prices reached for their products known to the trade for several years. How long these conditions may continue no one knows for when prices are regulated not by the cost of raw material plus that of labor, nor affected by the laws of supply and demand, and made merely through personal antagonism, vindictiveness or desire to punish some offending competitor, it is only a question of time when a reaction occurs, and we may some time suddenly be surprised by seeing the most discordant elements brought into one harmonious whole.

As to the future of prices it is hard to say. There must be undoubted truth in what we hear and read that the production of steel is contracted for for the first six months of the new year, and that all raw material is exceedingly scarce, that coal is high, that coke has been almost unobtainable, that transportation lacks the necessary rolling stock, and with these facts before us, which are the elements of cost in the manufacture of goods, the conservatism which has kept prices down may not be able to continually hold speculation in check, and the boom of 1899 may be repeated, especially as the conditions of the country are so much better than they were three years ago.

Louisville.

W. B. BELKNAP & Co.—The year goes out without any serious disturbance to mark it, filling us with wonder at the indefinite possibilities it has demonstrated for our country's consumption of iron and steel. When we were producing pig iron at the rate of 10,000,000 tons per annum it was supposed that we had reached high water mark. Now that it is running about 17,000,000 tons, there is still as great a scramble for raw material and for Bars and Bands and Plates as ever, and deliveries apparently cannot be promised till some considerable time in the future. That this state of affairs has existed for so long and still exists is a wonderful tribute to our consuming power as a nation.

In the midst of our prosperity, the report from Germany of 500,000 workmen out of employment, mills shut down, and no demand, sounds incredible. Of course, we shall some day reach the pivotal point ourselves, but it will be deferred longer, we think, if disasters follow each other in the productive departments in Pittsburgh such as one week has seen, Jones & Laughlins, Black Diamond Steel Company and Singer Nimick & Co. contributing successively to the sorry list. Still we as a people are

nothing if not rapidly recuperative, and these will soon pass into the forgotten. If we do not have any serious disturbances in mine or factory we shall soon be running full tilt again, and the immense tonnage which our country requires be provided for.

With the high prices paid for all agricultural products, there is every promise for a heavy demand in the spring for Agricultural Tools and Implements. There may be a scarcity of supply, particularly in these and allied articles like Trace Chains, which require an abundant supply of raw material in the first place and rapid, expeditious passage through the hands of skilled labor in the second.

The mills and factories hereabout had, we fancy, a full and prosperous year, as nearly all of them are enlarging their plants and declare that their order books for the first quarter of 1902 are well filled. The two rolling mills on this side of the river, with prospects for a third, a new Shovel and a new Bolt factory in successful operation, together with the rolling mills in our sister city, New Albany, carry evidences of prosperity. We think we can safely say that all the industries around the falls of the Ohio were never in better shape.

There are prospects of considerable plants being erected and put in operation here during the coming year. The cheap fuel and the ready transportation effected both by river and rail have given us material advantages, which have attracted much attention; from the railroads more perhaps than any other one branch of industry, for increase of terminal facilities and the enlargement of yards, &c., is very marked. We believe that they are simply looking ahead a couple of years.

The decisions of United States Judge Evans in the coal mining cases have practically broken up the union camps and put an end to the reign of terror, which was permitted to exist for too long a time down in Webster and Hopkins counties in the western part of the State. The State authorities let this hang on as did the English Parliament the Lord Gordon riots, so graphically described by Dickens in "Barnaby Rudge." When finally roused to a sense of duty, backed up by the revulsion in public sentiment and the United States Courts, the Grand Jury found it imperative to do its duty. Then those leaders, "presidents" and "vice-presidents," who had been exploited in the daily newspapers as the most powerful and prominent gentlemen of the day, were indicted, and are now being looked for by the sheriffs with warrants. Their wonderful promises and predictions as to what could be and what could not be have all been dissipated, and for a while at least we believe that any man, whether he be union or nonunion, that wants to work with a proper form of agreement with his employer will be permitted to do so. It seems strange that any other state of affairs should be permitted to exist for a day.

Portland, Oregon.

CORBETT, FAILING & ROBERTSON.—The first year of the new century, now closing, will be chronicled a success in the Pacific Northwest. We trust that the years to come will be, in the main, as prosperous as it has been. Our farmers, stock raisers and fruit growers, on the whole, have been successful in their vocations, both as to output and prices realized. Timber and lumber interests were never so prosperous, and a bright future is assured them. Our exports of lumber to China, Japan, Siberia and South Africa will soon be as extensive as flour exports to the same countries. Pennsylvania, Michigan and Wisconsin timber men have been buying timber lands, running into hundreds of thousands of acres, during the past two years.

Our dairy products are opening markets in the Philippines, China and Alaska. Our apples are a feature on the Waldorf-Astoria menu and hundreds of carloads go to England and Germany. Our sheep, grazing on the "thousand hills," are famous for their mutton and wool. Jerseys, shorthorns, Herefords and Ayrshires are prize winners, both in dairy and beef. Our horses, of Altamont and Hambletonian breed, are among the fastest in the world. Mining for gold, both placer and quartz, has never seen such an output, and in the near future will be our chief industry. Copper, too, is developing the fact that Nature has planted immense store-

houses of it within our confines, only awaiting capital to open the doors.

Above facts are leaking out, and the immigration tending toward the golden shores of the Pacific indicates that the year 1902 will surpass in prosperity that of 1901. Architects and builders are busy with work on hand and estimating for that to come.

San Francisco.

MILLER, SLOSS & SCOTT.—The year is about closing, and with it the two firms of Miller, Sloss & Scott and the Geo. W. Gibbs Company, who on the first day of January will consolidate and thereafter be known as the Pacific Hardware & Steel Company. So this will be the last letter written to *The Iron Age* from Miller, Sloss & Scott.

Travelers are now coming in to renew their samples, overhaul price books and adjust their affairs for the new year, with the outlook ahead that 1902 will be as prosperous as 1901.

The situation on the coast can be summed up in a few words. Trade is good, prices are well maintained, money is easier, customers are in good spirits and there is plenty of stock on the Pacific Coast for the starting of the new year. Under these circumstances we are again building up our hopes for a very prosperous new year.

St. Paul.

FARWELL, OZMUN, KIRK & Co.—At the close of the first year of the new century we are led to a deep feeling of congratulation and thanksgiving on the favorable business conditions that exist.

It is seldom that the business interests of the country have gone through the varying fortunes of the year with so much to commend and so little to depress. This feeling is also greatly intensified by the fact that 1901 is the fourth consecutive year of general prosperity in the Hardware trade of America.

In 1899—the banner year for the Hardwaremen—there were very favorable conditions in the beginning of the year. Prices had been abnormally low—much too low even to cover cost of production—and the signs of the times showed strongly that an advancing market was at hand, and this promise was more than realized as the months went by.

But 1901 opened under different conditions; prices in general had been advancing—in some case beyond the lines of prudence and good business principles—and were generally on the plane which would lead conservative men to believe that, while large declines might be avoided, falling prices were to be expected before the end of the year, and in forecasting the probable results of the year the prudent merchant set aside a part of his profits as likely to be swallowed by that insatiable monster that so often disturbs the surface of the business sea—a falling market.

These fears have not been realized; favorable crops, with reasonable prices for them; strikes in important manufacturing interests and the steady hand of large consolidated interests have all joined together in working to maintain a level market, and so the year has passed without great fluctuations and at its close we find prices firm in most lines, with the prospect of a strong market ahead till well on in the new year, and, so far as now can be seen, for the entire year. Indeed, the prospects are now much better for the coming year than they promised 12 months ago for 1901.

We have referred to 1899 as the banner year. But 1901 has been a better year in all respects except one—that of large advances in prices, with the corresponding drawback attending such advances, in the declines that are certain to come ahead.

In a steady market, both as to demand for goods and also as to prices, and in a healthy growth in business arising from actual wants and wholly separate from speculative and spasmodic action, the past year has probably never been surpassed in the history of the Hardware trade of this country.

Much the largest source of annoyance and loss experienced during the year has come from the unusual

difficulty in getting goods. This has not applied to all lines of Hardware, but it has been true of too many lines for the comfort and profit of both the wholesale and retail merchants.

As to the outlook for the new year, it certainly is full of reasonable promise for good to the Hardware trade. There are no signs of declining prices in the nearby horizon, nor of general financial disturbances, and with fair crops in 1902 there need be no serious conditions in trade in any early future. During the past year crops have been fair and have been unusually well distributed, and the people generally are prosperous, whether employed in farming, mining, lumbering or in mercantile pursuits, and it would seem certain that the conditions of general prosperity have never been more favorable than surround us as we enter on the second year of the new century.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—The closing of the year 1901 finds the average wholesale Hardware merchant either having completed or in the midst of stock or inventory taking, or if this is already completed, it finds him at work on the general footings.

The retail dealers of *The Iron Age*, who have a desire to conduct their business intelligently, will no doubt begin this process by January 2. We hope the results found in their footings of books will be eminently satisfactory to all.

The year closes, as it opened, with no cloud of distrust or doubt as to the future visible, but with an unprecedented basis of business activity, and sufficient orders upon the books of the heavy steel workers to require months to execute.

The various railroads during the past year have been taxed to their utmost. During a portion of that time fully 10,000 additional cars could have been used to advantage. Both manufacturers and merchants have been hampered in their trade owing to the lack of cars, and recently one of our important railroad officials informed a jobber (of whose business we have some intimate knowledge) that their road alone could use 5000 additional cars to advantage at the time of the conversation. Complaints have come in from the retail trade all over the country, even from near locations of, say, 100 miles distance, of the trouble they have in receiving their goods, or disappointment they have had in receiving goods for the Christmas holidays in the usual time required for transportation. This has been hard during the year for both manufacturers and merchants, as well as for the railroads themselves.

The fluctuations in Hardware during the year just closed have been comparatively few, less, perhaps, than for many years past. Declines during the same period have been equally few. This should be satisfactory to all who (as we do) think a steady market of fair values is most desirable to the trade at large.

Taking it as a whole, the past year has been one of record breaking activity in the various products of steel, iron and their correlatives. Yet we should not be unmindful of the fact that notwithstanding this, other conditions have surrounded us which might have made it one of disaster, had not the financial conditions of the country been upon a solid basis. The severe strain incidental to the stupendous strike of the steel and iron workers, the stock panic of the early summer, the shortness of the corn crop in the West, the shortness of the cotton crop in the South, the collapse in prices of both copper and copper stocks, the intense shock of the assassination of President McKinley, combined, have only temporarily retarded the processes of trade, which, under less favorable conditions, would have materially impaired credits.

Confidence is a tender plant, but during the past five years it has steadily and healthfully increased in strength.

Both pig iron and steel productions for the year have been one-sixth greater than ever before in the history of the country. The demand for coal has made the production of that article far in excess of any former year. Our export trade, which has been steadily growing, has reached a point during the past year somewhat stupen-

dous, and, taking it as a whole, the year closes with unprecedented activity in iron and steel products, taking both the capacity of the works of the manufacturer and the ability of the railroads to distribute.

We therefore close the year surrounded by general prosperity, which caused a general happy Christmas, and we enter into the new year with prospects of a profitable and satisfactory business.

The system of government under which we live and prosper makes possible a change like that we have recently passed through, from one President to another, without any change in policy, and consequently manufacturers and merchants all feel that there is no need for a change in their business policy. There are no fears of interruption, no lessening of the income of the average wage earner, no change required from the recent prosperous agricultural developments, no change required in either the giving or asking of credits, and we feel that the average merchant has grown financially stronger during the past few years. While business failures have not decreased in numbers during the past year, failures from actual loss sustained during 1901 have been considerably less.

We congratulate the readers of *The Iron Age* on living in the most prosperous country on the face of the globe, and the best governed country, where a population of 75,000,000 of people are the most satisfied and contented people in the world.

To all readers of *The Iron Age* we wish a happy and prosperous New Year.

NOTES ON PRICES.

Wire Nails.—The absence of lower quotations on Wire Nails for the past two weeks has given the trade more confidence in the stability of the market. The price ruling appears to be attractive, as jobbers are placing orders for future delivery. Prices, it is understood, are practically guaranteed to date of shipment. It is expected that the large retailers will come into the market after inventory taking, as has become more or less of a custom with them. The course of the market has justified the policy pursued by the trade in purchasing Nails in small lots, but it has resulted, almost universally, in small stocks throughout the country. Steel continues scarce and hard to obtain. Nails are quoted in carloads at \$2 to \$2.05, f.o.b. Pittsburgh.

New York.—The local market is showing the usual holiday quietness. The market is represented by the following quotations: Small lots from store, \$2.25 to \$2.30; carloads on dock, \$2.25.

Chicago, by Telegraph.—The leading manufacturers of Wire Nails report a very heavy business, not only for shipment to points affected by the recent cut in freight rates, but also to cover the requirements of the general trade in other sections. Heavy contracts are being booked by large distributors. The condition of the Wire Nail trade is peculiar, as the demand is so heavy, while prices do not show the tendency to strengthen as in other branches of iron and steel. The volume of business seems to be large enough to absorb the entire production at present. The outlook for the spring is exceedingly encouraging, and with the present low conditions of stocks it is believed that prices will hardly go to a lower point. Jobbers report a continued heavy demand from dealers, and quote small lots at \$2.25 to \$2.30, and carloads at \$2.20.

Pittsburgh.—There is no material change to note in the Wire Nail market. Considering the season of the year, demand is referred to by the manufacturers as being fairly satisfactory, the volume of trade at this time being a little larger than usual. The impression is growing in the trade that Wire Nails, in view of the scarcity and high price of steel, are about as low as they will go. Small mills that have to buy Rods cannot make Wire Nails at a profit at present prices. We quote Wire Nails in carloads at \$2 to \$2.05, and small lots, \$2.15 to \$2.20, depending on order.

Cut Nails.—Demand for Cut Nails is naturally light at this season, and has been curtailed to a greater ex-

tent than usual by the low price of Wire Nails. General quotations are as follows, f.o.b. Pittsburgh, plus the actual freight to point of destination, terms 60 days, or 2 per cent. off in 10 days:

Carload lots.....	\$2.05
Less than carload lots.....	2.10

New York.—Cut Nails are in moderate demand in this market. Representatives of mills are adhering to the price of \$2.25 for Nails from store. Jobbers are asking the same price generally, but in some instances are selling 2 cents below these figures. New York quotations for carload and less than carload lots are as follows:

Carload lots on dock.....	\$2.18
Less than carload lots on dock.....	2.23
From store.....	2.25

Chicago, by Telegraph.—The demand for Cut Nails is still curtailed by the supply of Wire Nails available at lower prices than Cut Nails. Small lots continue to be held at \$2.35 by jobbers.

Pittsburgh.—The Cut Nail mills have reaffirmed December prices for January delivery. The trade expected a reduction would be made in price of Cut Nails, but on account of Steel being so high, this was not done. Demand for Cut Nails is fairly satisfactory, considering the season of the year. We quote for domestic trade, f.o.b. Pittsburgh, plus Tube freight to point of destination, terms 60 days or 2 per cent. off in 10 days:

Carload lots.....	\$2.05
Less than carload lots.....	2.10

In some instances, and for very desirable orders, it is possible the above prices will be slightly shaded.

Barb Wire.—Orders for Barb Wire are being placed more liberally by jobbers and makers of Fencing. The market is somewhat irregular, with concessions in price from 5 to 10 cents per 100 pounds in some instances. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots, Painted.....	\$2.60
To jobbers in carload lots, Galvanized.....	2.90
To jobbers in less than carload lots, Painted.....	2.65
To jobbers in less than carload lots, Galvanized.....	2.95
To retailers in carload lots, Painted.....	2.70
To retailers in carload lots, Galvanized.....	3.00
To retailers in less than carload lots, Painted.....	2.80
To retailers in less than carload lots, Galvanized.....	3.10

Chicago, by Telegraph.—The orders for Barb Wire now being booked by manufacturers indicate that the coming spring is expected to be a period of heavy demand from dealers and consumers. The large buyers are making preparations to handle fully as large a tonnage as that of last spring. Stocks in manufacturers' hands are very low, and the general condition of the iron and steel trades would seem to make it reasonable to expect prices to be well maintained. Jobbers quote small lots at \$2.70 to \$2.80 for Painted, and \$3 to \$3.10 for Galvanized, with 5 cents off for carloads.

Pittsburgh.—Demand is light, and manufacturers of Barb Wire are going after the few orders that are being placed very aggressively, with the result that prices are being more or less shaded. The general market is quoted as follows: Galvanized Barb Wire, \$2.90 in carload lots to jobbers, and Painted, \$2.60. Terms 60 days net, 2 per cent. discount for cash in 10 days, f.o.b. Pittsburgh. These prices, however, are shaded from \$2 to \$3 or more, depending on the size of the order and point of shipment.

Plain Wire.—The demand for Plain Wire is larger than usual at this season, and may be said to be fairly satisfactory. Prices are shaded to some extent. Regular quotations are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. off for cash in 10 days:

Base sizes.	Plain.	Galv.
To jobbers in carload lots.....	\$2.25	\$2.65
To jobbers in less than carload lots.....	2.30	2.70
To retailers in carload lots.....	2.35	2.75
To retailers in less than carload lots.....	2.45	2.85

The above prices are for the base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

6 to 9.....	Base.....	\$0.40 extra.
10.....	\$0.05 advance over base.....	.40 "
11.....	.10 " " " ".....	.40 "
12 and 12½..	.15 " " " ".....	.40 "
13.....	.25 " " " ".....	.40 "
14.....	.35 " " " ".....	.40 "
15.....	.45 " " " ".....	.75 "
16.....	.55 " " " ".....	.75 "
17.....	.70 " " " ".....	1.00 "
18.....	.85 " " " ".....	1.00 "

For even weight bundles, 50 pounds and over, 5 cents per bundle advance on above.

Chicago, by Telegraph. The supply of Plain Wire has not yet increased sufficiently to have much influence on prices. The demand is so heavy that the current output appears to be well taken. Manufacturing consumers are placing good orders and an excellent foundation is being laid for the spring trade. Jobbers quote small lots from stock at \$2.20 to \$2.25.

Pittsburgh.—Consumers are placing large contracts and the outlook for spring trade is excellent. General quotations to the trade are as follows:

To jobbers in carload lots.....	\$2.25
To jobbers in less than carload lots.....	2.30
To retailers in carload lots.....	2.35
To retailers in less than carload lots.....	2.45

Galvanized Wire up to No. 14 is 40 cents advance on Plain; Nos. 15 and 16, 75 cents advance, and Nos. 17 and 18, \$1 advance. Terms are 60 days, with 2 per cent. off for cash in 10 days, f.o.b. Pittsburgh. These prices, however, are materially shaded, especially on good orders.

Boxwood and Ivory Rules.—A new and thoroughly revised list of Boxwood and Ivory Rules has been adopted by the manufacturers. In the list which has been in use a number of inequalities were developed, and in order to correct this condition the new list prices have been agreed upon. The base discount on Boxwood Rules has been reduced, and is now 60 per cent. The new list, as announced by the Upson Nut Company, Unionville, Conn., and Cleveland, Ohio, is as follows:

BOXWOOD RULES.

No.	One Foot, Four Fold, Narrow.	Per dozen.
60.	Round joint, middle plates, 8ths and 16ths of inches, ¼ inch wide.....	\$1.75
65.	Square joint, middle plates, 8ths and 16ths of inches, ¼ inch wide.....	2.00
64.	Square joint, edge plates, 8ths and 16ths of inches, ¼ inch wide.....	2.75
64½.	Square joint, half bound, 8ths and 16ths of inches, ¼ inch wide.....	4.50
65½.	Square joint, full bound, 8ths and 16ths of inches, ¼ inch wide.....	5.50
55.	Arch joint, middle plates, 8ths and 16ths of inches, ¼ inch wide.....	2.25
56.	Arch joint, edge plates, 8ths and 16ths of inches, ¼ inch wide.....	3.25
56¼.	Arch joint, edge plates, 8ths and 16ths of inches, ¼ inch wide.....	4.00
56½.	Arch joint, half bound, 8ths and 16ths of inches, ¼ inch wide.....	5.00
57.	Arch joint, full bound, 8ths and 16ths of inches, ¼ inch wide.....	6.00

Two Feet, Four Fold, Extra Narrow.

61½.	Square joint, middle plates, 8ths and 16ths of inches, ¼ inch wide.....	3.25
63½.	Square joint, edge plates, 8ths and 16ths of inches, ¼ inch wide.....	4.25
62¼.	Square joint, full bound, 8ths and 16ths of inches, drafting scales, ¼ inch wide.....	8.00

Two Feet, Four Fold, Narrow.

68.	Round joint, middle plates, 8ths and 16ths of inches, 1 inch wide.....	2.50
61.	Square joint, middle plates, 8ths and 16ths of inches, 1 inch wide.....	3.00
63.	Square joint, edge plates, 8ths, 10ths and 16ths of inches, drafting scales, 1 inch wide.....	4.00
64.	Square joint, half bound, 8ths and 16ths of inches, drafting scales, 1 inch wide.....	6.50
62.	Square joint, full bound, 8ths and 16ths of inches, drafting scales, 1 inch wide.....	8.00
51.	Arch joint, middle plates, 8ths and 16ths of inches, drafting scales, 1 inch wide.....	3.25
53.	Arch joint, edge plates, 8ths, 10ths and 16ths of inches, drafting scales, 1 inch wide.....	4.25
53½.	Arch joint, edge plates, 8ths, 10ths, 12ths and 16ths of inches, with inside beveled edges, architects' drafting scales, 1 inch wide.....	7.50
52.	Arch joint, half bound, 8ths and 16ths of inches, drafting scales, 1 inch wide.....	7.00
54.	Arch joint, full bound, 8ths and 16ths of inches, drafting scales, 1 inch wide.....	8.50
59.	Double arch joint, bitted, 8ths and 16ths of inches, drafting scales, 1 inch wide.....	5.00
50.	Double arch joint, full bound, 8ths and 16ths of inches, drafting scales, 1 inch wide.....	10.50

Two Feet, Four Fold, Broad.

67.	Round joint, middle plates, 8ths and 16ths of inches, 1½ inches wide.....	3.00
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70.	Square joint, middle plates, 8ths and 16ths of inches, drafting scales, 1½ inches wide.....	4.00
72.	Square joint, edge plates, 8ths, 10ths and 16ths of inches, drafting scales, 1½ inches wide.....	5.00
72¼.	Square joint, half bound, 8ths, 10ths and 16ths of inches, drafting scales, 1½ inches wide.....	8.00
72½.	Square joint, full bound, 8ths, 10ths and 16ths of inches, drafting scales, 1½ inches wide.....	9.00
73.	Arch joint, middle plates, 8ths and 16ths of inches, drafting scales, 1½ inches wide.....	5.00
75.	Arch joint, edge plates, 8ths, 10ths and 16ths of inches, drafting scales, 1½ inches wide.....	6.00
76.	Arch joint, full bound, 8ths, 10ths and 16ths of inches, drafting scales, 1½ inches wide.....	10.00
77.	Double arch joint, bitted, 8ths, 10ths and 16ths of inches, drafting scales, 1½ inches wide.....	6.50
78.	Double arch joint, half bound, 8ths, 10ths and 16ths of inches, drafting scales, 1½ inches wide.....	10.00
78½.	Double arch joint, full bound, 8ths, 10ths and 16ths of inches, drafting scales, 1½ inches wide.....	12.00

Two Feet, Four Fold, Slide.

83.	Arch joint, edge plates, Gunter's slide, 8ths, 10ths, 12ths and 16ths of inches, 100ths of a foot and octagonal scales, 1½ inches wide.....	8.00
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Board Measure, 2 Feet, Four Fold.

79.	Square joint, edge plates, 12ths and 16ths of inches, drafting scales, 1½ inches wide.....	6.00
81.	Arch joint, edge plates, 12ths and 16ths of inches, drafting scales, 1½ inches wide.....	7.00
82.	Arch joint, bound, 12ths and 16ths of inches, drafting scales, 1½ inches wide.....	11.00

Two Feet, Six Fold.

58.	Arch joint, edge plates, 8ths and 16ths of inches, ¼ inch wide.....	6.50
58½.	Arch joint, full bound, 8ths and 16ths of inches, ¼ inch wide.....	18.00

Two Feet, Two Fold.

29.	Round joint, 8ths and 16ths of inches, 1½ inches wide.....	2.25
18.	Square joint, 8ths and 16ths of inches, 1½ inches wide.....	3.50
22.	Square joint, bitted, board measure, 12ths and 16ths of inches, octagonal scale, 1½ inches wide.....	4.00
1.	Arch joint, 8ths and 16ths of inches, octagonal scales, 1½ inches wide.....	4.00
2.	Arch joint, bitted, 8ths and 16ths of inches, octagonal scales, 1½ inches wide.....	4.50
4.	Arch joint, bitted, extra thin, 8ths and 16ths of inches, drafting and octagonal scales, 1½ inches wide.....	6.00
5.	Arch joint, bound, 8ths, 10ths and 16ths of inches, drafting and octagonal scales, 1½ inches wide.....	9.00

Two Feet, Two Fold, with Slide.

26.	Square joint, plain slide, 8ths, 10ths and 16ths of inches, octagonal scales, 1½ inches wide.....	6.00
27.	Square joint, bitted, Gunter's slide, 8ths, 10ths and 16ths of inches, 100ths of a foot, drafting and octagonal scales, 1½ inches wide.....	8.00
12.	Arch joint, bitted, Gunter's slide, 8ths, 10ths and 16ths of inches, 100ths of a foot, drafting and octagonal scales, 1½ inches wide.....	9.00
15.	Arch joint, bound, Gunter's slide, 8ths, 10ths and 16ths of inches, drafting and octagonal slides, 1½ inches wide.....	13.00
6.	Arch joint, bitted, Gunter's slide, engineering, 8ths, 10ths and 16ths of inches, 100ths of a foot, octagonal scales, 1½ inches wide.....	12.00
10.	Arch joint, bound, Gunter's slide, engineering, 8ths, 10ths and 16ths of inches, octagonal scales, 1½ inches wide.....	16.00

Three-Inch Caliper Rule.

100.	8ths, 16ths and 32nds of inches.....	6.00
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Three Feet, Four Fold.

66.	Arch joint, middle plates, 16ths of inches and 8ths of a yard, 1 inch wide.....	5.00
66½.	Arch joint, middle plates, 8ths and 16ths of inches, 1 inch wide.....	5.00

SHIP CARPENTERS' BEVELS.

42.	Boxwood, double tongue, 8ths and 16ths of inches....	4.00
43.	Boxwood, single tongue, 8ths and 16ths of inches....	4.00

BOXWOOD CALIPER RULES.

36.	Square joint, 6 inches, two-fold, 8ths and 16ths of inches, ¼ inch wide.....	3.50
36½.	Square joint, 1 foot, two-fold, 8ths, 10ths, 12ths and 16ths of inches, 1½ inches wide.....	6.00
32.	Arch joint, edge plates, 1 foot, four-fold, 8ths, 10ths and 16ths of inches, ¼ inch wide.....	6.00
32½.	Arch joint, bound, 1 foot, four-fold, 8ths, 10ths, 12ths and 16ths of inches, ¼ inch wide.....	10.00
13½.	Square joint, two-fold, 8ths and 16ths of inches, 1½ inches wide.....	6.00

IVORY RULES.

Ivory Caliper Rules.

38.	Square joint, German silver mountings, 6 inches, two-fold, 8ths and 16ths of inches, ¼ inch wide.....	15.00
39.	Square joint, edge plates, German silver mountings, 1 foot, four-fold, 8ths, 10ths and 16ths of inches, ¼ inch wide.....	38.00
40.	Square joint, German silver bound, 1 foot, four-fold, 8ths and 16ths of inches, ¼ inch wide.....	44.00
40½.	Square joint, German silver bound, 1 foot, two-fold, 8ths, 10ths, 12ths and 16ths of inches, ¼ inch wide.....	24.00
<i>Ivory, 6 inches, Two-Fold.</i>		
93.	Round joint, brass, 8ths and 16ths of inches.....	4.50
<i>Ivory, 1 Foot, Four Fold.</i>		
90.	Round joint, brass, middle plates, 8ths and 16ths of inches.....	10.00
92½.	Square joint, German silver, middle plates, 8ths and 16ths of inches, ¼ inch wide.....	14.00
92.	Square joint, German silver, edge plates, 8ths and 16ths of inches, ¼ inch wide.....	17.00
91.	Square joint, German silver, edge plates, 8ths, 10ths and 16ths of inches, ¼ inch wide.....	23.00

91½. Square joint, German silver, full bound, 8ths and 16ths of inches, ¾ inch wide.....	30.00
88½. Arch joint, German silver, edge plates, 8ths and 16ths of inches, ¾ inch wide.....	21.00
88. Arch joint, German silver, full bound, 8ths and 16ths of inches, ¾ inch wide.....	32.00
<i>Ivory, 2 Feet, Four Fold, Extra Narrow.</i>	
85. Square joint, German silver, edge plates, 8ths, 10ths and 16ths of inches, ¾ inch wide.....	54.00
<i>Ivory, 2 Feet, Four Fold, Narrow.</i>	
86. Arch joint, German silver, edge plates, 8ths, 10ths and 16ths of inches, 100ths of a foot, drafting scales, 1 inch wide.....	64.00
87. Arch joint, German silver, bound, 8ths, 10ths and 16ths of inches, drafting scales, 1 inch wide.....	80.00
89. Double arch joint, German silver, bound, 8ths, 10ths and 16ths of inches, drafting scales, 1 inch wide.....	92.00
<i>Ivory, 2 Feet, Four Fold, Broad.</i>	
95. Arch joint, German silver, bound, 8ths, 10ths and 16ths of inches, drafting scales, 1½ inches wide.....	102.00
97. Double arch joint, German silver, bound, 8ths, 10ths and 16ths of inches, drafting scales, 1½ inches wide.....	116.00

MISCELLANEOUS ARTICLES.

<i>Bench Rules.</i>	
34. Bench Rules, 2 feet.....	3.00
35. Bench Rules, board measures, 2 feet.....	6.00
<i>Board Measures.</i>	
46. Board Sticks, octagonal, brass cap, 2 feet.....	8.00
47. Board Sticks, octagonal, brass cap, 3 feet.....	12.00
43½. Board Sticks, flat, hickory, cast brass head and tip, 3 feet.....	12.00
49. Board Sticks, flat, hickory, steel head, brazed, extra strong, 3 feet.....	26.00
48. Walking Cane, octagonal, hickory, turned brass head and tip, 3 feet.....	12.00
<i>Log Measures.</i>	
48½. Walking Cane, octagonal, hickory, turned brass head and tip, 3 feet.....	15.00
<i>Yard Sticks.</i>	
33. Yard Sticks, polished.....	2.00
41. Yard Sticks, brass tips, polished.....	3.50
50. Yard Sticks, hickory, brass capped ends, polished.....	4.50
<i>Wantage and Gauging Rods.</i>	
44. Wantage Rods, 8 lines.....	5.00
37. Wantage Rods, 12 lines.....	7.00
45. Gauging Rods to 120 gallons, 3 feet.....	7.00
45½. Gauging Rods with wantage tables, 4 feet.....	18.00

<i>School Rules.</i>	
98. Boxwood, 12 inches, beveled edges, 8ths and 16ths of inches, ¾ inch wide.....	1.25
99. Boxwood, 12 inches, beveled edges, 10ths and 16ths of inches, ¾ inch wide.....	1.50

Stanley Rule & Level Company.—Stanley Rule & Level Company, New Britain, Conn., issue under date January 1 the following revised discount sheet applying to their price-list No. 28:

	Discount. Per cent.
Rules, Boxwood.....	60
Rules, Brass, Blacksmiths'.....	20
Rules, Zig-Zag.....	25
Rules, Shrinkage.....	50
Rules, Ivory, Stanley.....	35
Rules, Ivory, Stearns.....	35
Rules, Extension.....	25
Rules, miscellaneous.....	50
Plumbs and Levels.....	40
Plumbs and Levels, Duplex.....	20
Plumbs and Levels, Victor.....	20
Plumbs and Levels, Masons'.....	40
Plumbs and Levels, Masons', No. 35.....	40
Plumbs and Levels, ground glasses.....	25
Plumbs and Levels, metallic, Nos. 36 and 37.....	20
Levels, Eclipse, No. 34.....	20
Levels, Machinists', Iron, Nos. 38½ and 39½.....	20
Pocket Levels.....	40
Pocket Levels, Hexagon, Nos. 31 and 33.....	20
Level Glasses, proved.....	50
Level, Bit and Square.....	20
Level Sights.....	20
Bevels, Sliding T, No. 23.....	33 1-3
Bevels, Eureka, No. 18.....	30
Try Squares, Adjustable, No. 14.....	30
Miter Squares, No. 16.....	30
Try Squares, No. 20.....	33 1-3
Try Squares, No. 12.....	30
Try Squares, No. 10.....	30
Try and Miter Squares, No. 1.....	40
Try and Miter Squares, No. 2.....	40
Miter Try Squares, No. 15.....	30
Gauges.....	50
Gauges, Metallic, Nos. 90 and 91.....	20
Gauges, Bit and Rabbet, No. 92.....	20
Gauges, Butt, No. 95.....	20
Gauges with Improved face plate.....	50
Planes, Red Rock.....	20
Plane Parts.....	20
Planes, Bailey, Iron.....	25
Planes, Bailey, Wood.....	25
Plane Irons, Bailey.....	20
Planes, Bailey, Block.....	25
Planes, Knuckle Joint, Block.....	25
Planes, Low Angle, Block.....	25
Plane Irons, Bailey, Block.....	20
Planes, Stanley, Block.....	25
Plane Irons, Stanley, Block.....	20
Planes, Stanley, Steel.....	25
Planes, Stanley, Wood.....	25
Plane Irons, Stanley.....	20
Planes, Bull Nose, No. 75.....	25
Planes, Circular, Nos. 13, 20, 20½, 113.....	20
Planes, Carriage Makers' Rabbet.....	25
Planes, Cabinet Makers' Block, No. 9.....	20
Planes, Scraper, No. 112.....	20
Planes, Veneer Scraper, No. 12.....	20
Planes, Belt, No. 11.....	20

Planes, Scrub, Nos. 40 and 40½.....	20
Planes, Rabbet, Nos. 180 to 192.....	20
Planes, Rabbet and Filletster, No. 78.....	20
Planes, Dado, No. 39.....	20
Planes, Tongue and Groove, Nos. 48 and 49.....	20
Planes, Router, Nos. 71 and 71½.....	20
Planes, Core Box, No. 57.....	20
Planes, Floor, No. 74.....	20
Planes, Cabinet Makers' Rabbet, Nos. 90 to 94.....	20
Planes, Side Rabbet, Nos. 98 and 99.....	20
Planes, Rabbet and Block, No. 140.....	20
Planes, Chamfer, Nos. 72 and 72½.....	20
Planes, Beading, No. 50.....	20
Plows, Dado, &c., Nos. 46 and 47.....	20
Plows, Bull Nose, Nos. 141 and 143.....	20
Plane, Beading, Rabbet, &c., No. 45.....	20
Hollows and Rounds for Plane No. 45.....	20
Nosing Tool for Plane No. 45.....	20
Cutters for Universal Plane, No. 55.....	20
Planes, Universal, No. 55.....	20
Scrapers, Hand, No. 0.....	20
Scrapers, Cabinet, No. 80.....	20
Scrapers, Wood, No. 83.....	20
Scrapers, Box, No. 70.....	30
Chisel Gauge, No. 96.....	20
Miter Boxes, Nos. 50 and 60.....	20
Odd Jobs.....	20
Pencil Clasp.....	20
Roofing Brackets.....	20
Spoke Shaves.....	50
Spoke Shave Cutters.....	50
Spoke Shave, Universal, No. 67.....	20
Hand Readers, Nos. 66 and 69.....	20
Plumb Bobs, Adjustable.....	30
Trammel Points, Nos. 1, 2, 3 and 4.....	30
Trammel Points for Rules, No. 99.....	20
Countersinks, Nos. 18 and 20.....	40
Dowel Sharpeners, No. 22.....	40
Cornering Tools.....	20
Clapboard Marker.....	20
Clapboard Gauge.....	20
Awl Hafts.....	50
Awls, Patent Pegging.....	50
Scratch Awls, Handled.....	30
Brad Awls, Handled.....	30
Handles, Brad Awl.....	30
Mallets.....	30
Handles, Saw.....	40
Handles, Plane.....	40
Chalk Lines, Reels and Awls.....	30
Hammers, Magnetic.....	40
Hammers, Tack, No. 4.....	40
Hammers, Steak.....	40
Tool Handles, Excelsior.....	20
Screw Drivers, No. 64.....	60
Screw Drivers, No. 86.....	70
Screw Driver Handles.....	55

The company are about issuing their new catalogue No. 28, which contains various changes in list prices of important lines. It also illustrates some improvements they have recently made in their Tools and a number of new Tools not previously listed. Changes are thus made in the list prices of the following goods: Boxwood Rules, Plumbs and Levels, Pocket Levels, T Bevels No. 25, Try Squares No. 20 and Planes. It is especially to be noted that their list prices on Boxwood Rules have been entirely revised, and in the coming year will be subject to a base discount of 60 per cent. in place of 75 per cent. in use during the past year. The list price of Wooden Plumbs and Levels, which last year were subject to a base discount of 70 per cent., has been revised and the new list takes a base discount of 40 per cent. The same is true of the list prices of Common Pocket Levels. The list prices of Rosewood Handled T Bevels No. 25 and Rosewood Handled Try Square No. 20, heretofore subject to a base discount of 60 per cent., have been revised, and the new list takes a base discount of 33 1-3 per cent. A great number of the standard Bailey and Stanley Planes, both iron and wood, have been regrouped, and new lists issued subject to base discounts of 20 or 25 per cent., instead of the former lists subject to a base discount of 50 per cent. In connection with this announcement of revised prices the company issue a condensed price-list giving the numbers and list prices of the various goods referred to in their illustrated price-list about to be issued.

Sheet Copper, &c.—The market in this line is naturally unsettled in view of the condition of Ingot Copper. It is thought not unlikely that a substantial reduction in price will be made early in the year. Copper Rivets and Burrs have not as yet been changed in price, and an effort will probably be made to maintain prices, if feasible, as manufacturers are understood to have ample stocks on hand. Brass Sheets, Wire, Rods, &c., are also somewhat unsettled in price for the same reason.

Tinware.—The manufacturers of Tinware, Pieced and Stamped, have recently been in conference, and it is not unlikely that as a result the market with the opening year will be in excellent condition, with a possibility of somewhat advanced prices.

Cordage.—The Rope market continues with the pro-

vious diversity in quotations by different manufacturers, as follows, on a basis of 7-16 inch and larger: Sisal Rope, 8½ to 9¼ cents; Manila Rope, 12¾ to 13 cents, with ¼ cent per pound in large quantities allowed on both kinds of Rope. Demand is fair, and with some makers is larger than was anticipated.

Glass.—The future of the Window Glass market still remains uncertain. It is reported that at the meeting held on December 28, at Muncie, Ind., the outside independent and co-operative factories failed to reach a harmonious working agreement with the American Window Glass Company and the Independent Glass Company. It is stated that an advance of 15 per cent. will be made should the American, Independent, co-operative and independent factories subsequently agree upon a distribution of sales; also that there is scarcely any likelihood of the old prices being restored, as they were high enough to allow foreign Glass to come into this country. The statement is made that the American and Independent companies are anxious for peace, as disruption promises to hurl the trade into a worse condition than it has been for some time. Under present conditions the outlook is for lower prices of Glass.

Paints and Colors.—*Lead.*—The reduction in the price of White Lead in Oil, in lots of 500 pounds or over, is being held for the best known brands. In other brands, not so well known, there is some irregularity in prices. It is reported that a new make of White Lead in Oil is being offered for delivery after January 15 in large lots at 5½ cents per pound.

Oils.—*Linseed Oil.*—Demand for Linseed Oil at the present time is confined to small lots, at the following quotations: City Raw, in lots of five barrels or more, 55 cents; in lots of less than five barrels, 57 cents per gallon. Out of town brands are held at 54 to 55 cents, according to quantity. Out of town crushers are naming 58 cents per gallon for deliveries, January to June. Buyers are unwilling to purchase at these figures. The market is firm.

Spirits Turpentine.—The market is quiet, with demand moderate. Reports from the South are of a decline in price, owing to large receipts. In the absence of active demand in the local market holders made no change in prices, which are as follows, according to quantity: Southern, 39 to 39½ cents; machine made barrels, 39½ to 40 cents per gallon.

"SIMPLY A RECORD."

AS a New Year's greeting, Norvell-Shapleigh Hardware Company, St. Louis, have issued a daintily printed pamphlet with the above title. It is suggestive as an illustration of skillful address to the trade, which cannot fail to accomplish its purpose. It touches upon a number of matters of general interest, as well as upon the business of the company, with a frank and familiar manner of address which gives the printed circular almost the charm of a personal appeal. The importance of this personal relationship between buyer and seller is recognized by many merchants who may not have the faculty of securing it, and to them as well as to students generally of the art of circularizing the following extracts, taken almost at random, will be suggestive:

JANUARY 1, 1902.

As a man grows older, and we hope wiser, should he not grow simpler, more direct and more straightforward in his contact with his fellows? Is not this the higher development? It has been truly said that "one touch of nature makes the whole world kin," and is not often our affection held by the very roughness, awkwardness and imperfections of our friends?

ARE YOU NOT TIRED

of receiving imitation typewritten letters with a photographed signature? Of course these letters are "personal"—they are written to only 9999 others besides yourself. Some of these letters are works of art; they even have the periods punched through the paper. Some have "fake" erasures. On others, in their haste, the young ladies who do the addressing forget to change the ribbon on their typewriters and the body of the letter being in blue ink with the address in light green, does not give that same closeness, that personal nearness in the correspondence that might be desired. Have we not outgrown such shallow deception? Is it not time for us to give our good friends in the trade a rest?

"IT'S UP TO ME"

to say something to our friends and customers at the conclusion of our first six months' business. I was inclined

at first to give you the usual thing, served up in the usual style, but I decided just this once to sit down with you, as it were, on a dry goods box, and tell you some of the inside history, some of the things that have happened to us since July 1, when we issued SIMPLY A STATEMENT.

VOLUME OF BUSINESS.

There are many other things more or less interesting that I might tell you of our first six months. I might write you a few pages on the subject of shipping Mail Orders the day they are received and how we do it. But one of my good friends in the trade not long ago wrote me a letter in which he said: "If you love me, quit writing about Mail Orders. Devote your time to taking care of them. This subject has been worn to a frazzle. The trade is weary."

His letter gave me a chain of thought, and I wondered why it was that most jobbers pay such high prices for the talent they devote to getting Mail Orders and such low prices for the talent that takes care of them. And I made up my mind that this house would. But we are not making any promises this time.

LAYING JOKING ASIDE,

the object of this pamphlet is simply to invite your attention to the fact that we are still on earth. Our business has been more than double what it was the last six months of last year. We are carrying a very much greater variety and a heavier stock of goods. Our force of salesmen and our house force have been increased about 50 per cent. Our rent is practically the same as it was a year ago. We are covering a very much larger territory with our salesmen. Taking these facts into consideration, it is reasonable to conclude that we have sold more goods per salesman, have done more work per employee, and the percentage of cost of doing our business is considerably less in proportion to our sales than formerly. The relation of expense account to sales is one of the serious problems in a jobbing business.

BEECHE, DUVAL & CO.

AN interesting feature of the export trade is the change announced by the firm of Beeche & Co. Since July 1, 1897, this firm have conducted their purchases and shipments for the west coast of South America through Flint, Eddy & Co. and their successors, the Flint, Eddy & American Trading Company. The agreement for the conduct of business in this way expired on December 31 and on the 1st inst. Beeche & Co. take into their own hands their purchases and shipments, transacting the business hereafter under the title of Beeche, Duval & Co. George L. Duval, the resident partner of this firm, has been for some years a vice-president of the Flint, Eddy & American Trading Company, but in view of the large development of the business of both firms has found it desirable to concentrate his attention on the business of the west coast of South America. The firm of Beeche & Co. and their predecessors, Browne, Beeche & Co. and Hemenway & Browne, have been very prominently identified with the west coast trade for many years, the business having been established 74 years ago by Augustus Hemenway. They have their own house in Valparaiso, Chili, and agencies all along the west coast of South America, particularly Chili, Peru and Ecuador. The firm have maintained for several years past a regular steam service between New York and west coast ports under the title of the West Coast Line, which during the last two years has dispatched 16 to 18 steamers annually. The firm of Beeche, Duval & Co. have removed from the nineteenth to the tenth floor of the Broad-Exchange Building, 25-33 Broad street, where a fine suite of offices has been secured.

Papers have been filed incorporating the Clifford Hardware Company, who on January 1 succeed the firm of Geo. S. Sonntag & Co., conducting a wholesale Hardware business at Evansville, Ind. The directors of the new company are A. G. Clifford, G. S. Clifford, F. E. Smith and B. V. Somes. The Messrs. Clifford have for the past 12 years been proprietors of the firm of Geo. S. Sonntag & Co., established in 1858, and will be in control of the new company, retaining the services of all those connected with the old firm. Mr. Smith, who has been for the past eight years with the Simmons Hardware Company, St. Louis, and Mr. Somes, formerly with the Van Camp Hardware & Iron Company, Indianapolis, will look after the largest trade, and, with the assistance of the traveling force of the old firm, will thoroughly cover the territory. The company will carry a full stock of Shelf Hardware, Cutlery, Guns, Ammunition and Sporting Goods, and Tinware and Enamelled Ware, and will do a jobbing business exclusively.

PRICE-LISTS, CATALOGUES, &c.

GRAND RAPIDS REFRIGERATOR COMPANY, Grand Rapids, Mich.: Catalogue of the Refrigerators manufactured by this company under the names of the Leonard Cleanable, Northern Light and Champion. The Leonard Cleanable is the leading line and consists of a great variety of sizes. Refrigerators of this style are all made of ash or oak, fitted with the Leonard patented system for circulation and refrigeration, constructed with eight separate and distinct walls protecting the contents from the outside air, and have the Leonard patent Refrigerator lock, the Leonard patent method of interior construction, the Leonard patent ice rack, the Leonard patent sliding adjustable shelves and the patented method of enabling the entire interior to be removed to permit the flues to be washed. The Leonard Cleanable also includes numerous elaborate sideboard constructions. A number of sizes are furnished with a lining of genuine porcelain instead of zinc. The Northern Light line is provided with a removable ice tank among other special features. This line is made in special styles, comprising the standard sizes. The Champion line is more extensive than the Northern Light, and is presented to the trade as a well made Refrigerator at a lower price than the Leonard Cleanable.

LANG CUTLERY WORKS, 240 to 246 West Lake street, Chicago: Illustrated circular and price-list of Lang's Right and Left Hand Thread Bolt Shears and Bankers' and Barbers' Shears. Lang's Thread Bolt Shears are made either straight or bent and of an oval pattern, which presents complete curves in the outlines and makes a handsome finish. A line of Flat Shears is also made in all sizes.

THE INDIANA MFG. COMPANY, Peru, Ind.: Catalogues of the North Star Refrigerators. One of these catalogues, consisting of 56 pages, presents illustrations of the full line, comprising constructions intended for every requirement of domestic use, beautiful Sideboards and large sized Refrigerators for grocers, butchers, &c. The North Star Refrigerators embody an efficient method of securing the circulation of air, and the insulation is accomplished by a combination of dead air space and granulated cork. These Refrigerators have seven walls. The ice rack is of new design and made entirely of galvanized steel. The trap is ingeniously constructed to serve the purpose for which it is designed. A portion of this catalogue is devoted to the illustration of tile lined Refrigerators, the company making a very complete line of this class of Refrigerators. Several pages are used in presenting illustrations of the Indiana hard wood Refrigerator, which is a first-class construction furnished at a lower price. A second catalogue treats exclusively of tile lined Refrigerators. The illustrations of this catalogue are of a specially high order of merit. The shelves, pipe, top of provision chamber and door bindings of these Refrigerators are finished with four coats of enamel thoroughly baked on. Shelf tiles are used for shelf supports, making a very much better finished interior.

FOX CUTLERY COMPANY, Dubuque, Iowa: Circular giving extracts from letters which have been received from users of Fox Razors. These testimonials are interesting and speak well of the high quality of the Cutlery manufactured by this company.

W. J. ADAM, ADAM'S STEEL & WIRE WORKS, Joliet, Ill.: Catalogue of the Adam's Woven Wire and Ornamental Steel Fencing and special designs in wire and iron work. This catalogue shows a great variety of designs in Ornamental Steel Fences, some of which are wholly constructed of steel pickets, while others are partly constructed of woven wire. It also shows a special field fence made of wooden slats woven with strong wire, capable of being compactly rolled for shipping. Numerous designs of Steel Posts are given. The catalogue further presents illustrations of Wire Counter Railings, Office Partitions, Steel Window Guards, Steel Cages for lockups and jails, Steel Stable Fixtures, Portable Corn Cribs, &c. The products of these works also comprise Bale Ties and Adam's Green Bone Cutter.

IWAN BROS., Streator, Ill.: Illustrated circular calling attention to the Iwanpatent improved Post Hole and Well

Auger. An illustration and description are given of this tool, together with a reproduction of the Chicago World's Fair diploma awarded the firm in consideration of the "convenience and effectiveness of operation and excellence of material and construction" of this tool. A large number of testimonials are also printed. A second circular, artistically printed in colors, treats of the Iwan improved serrated Hay Knife. This Knife has handles which can be adjusted to two positions, enabling the Knife to be suited to the needs of either tall or short men, thus securing greater effectiveness in its use.

FRANK L. JONES, Utica, N. Y.: Price-list of Apparatus, Supplies and Specialties for cheese factories, creameries, dairies, milk stations, milk dealers, &c., of which he is manufacturer.

THE WINFIELD MFG. COMPANY, Warren, Ohio: Circular illustrating and describing their Anchor Sap Spout, which they have been making for 15 years.

MAINE MFG. COMPANY, Nashua, N. H.: An attractive poster calling attention to their White Mountain Refrigerators. The company are prepared to furnish the posters in liberal quantities to their customers, printing firm name and address in the margin at the bottom.

GRAY & DUDLEY HARDWARE COMPANY'S BANQUET.

IN accordance with their usual custom, the Gray & Dudley Hardware Company, Nashville, Tenn., entertained the officers, salesmen and other employees of the company with a banquet on the night of December 26. This was decidedly the best attended and most enjoyable banquet in the history of the company. The function was given in the Tulane Hotel and about 150 persons participated, including 40 traveling salesmen. R. M. Dudley, president of the company, acted as toastmaster and delivered the address of welcome, in which he referred to the success of the house and assigned as the reason for it the splendid system in force and the fact that the employees co-operate most efficiently.

CALENDARS, &c.

BURGESS-FRAZER IRON & HARDWARE COMPANY, St. Joseph, Mo., manufacturers' agents and dealers in Heavy Hardware.

H. F. HERTZOG, Reading, Pa., wholesale and retail Hardware, Sporting Goods, Seeds, &c.

KIRCHER & SON, Belleville, Ill., Hardware merchants: Weekly calendar for 1902.

P. ROBINSON & SON, Philo, Ill., Hardware and Stove dealers.

NORVELL-SHAIPLEIGH HARDWARE COMPANY, St. Louis: Glass paper weight, which they will be pleased to send to any regular dealer in Hardware without charge.

TROY NICKEL WORKS, Albany, N. Y.: Diary for 1902, with sectional maps of the United States, facts in regard to the census, &c.

SEMMES HARDWARE COMPANY, Savannah, Ga., wholesale Hardware merchants.

REQUEST FOR CATALOGUES, &c.

The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

The Great Bend Implement Company, Great Bend, Kan., dealers in Hardware, Farm Machinery, Buggies, Wagons, &c., request copies of catalogues as well as quotations on Wrought, Cast and Malleable Iron Fences, also Wire Ornamental Fencing.

THE PENN SHOVEL COMPANY.

THE PENN SHOVEL COMPANY, Corry, Pa., are building an addition to their factory, 50 x 100 feet in size, and expect to commence at once the manufacture of a full line of Antrim Pattern Shovels. They are now making a complete line of Hollow Back goods, and when they get their new equipment will have an output of 300 dozen Shovels per day.

Notes on Foreign Trade.

THE EXPORT OUTLOOK.

Generally speaking, the volume of our export trade in Iron and Steel and related products is somewhat reduced. The reduction is principally in the heavy lines, a gradually increasing variety of manufactured products going to practically all the markets of the world. The immediate falling off in volume in certain lines is believed to be temporary, and is referred to by a prominent exporter as largely on account of "Germany's bargain counter prices," as the trade they have recently secured at our expense has been obtained largely at the sacrifice of profit. England is very hard at work to learn the industrial and commercial lessons we have to teach, and the manufacturing countries of the Continent are also preparing to use their facilities with increased effect, so that it will probably be less of a walkover for America than was the case in 1901.

Europe.

European business is in excellent condition and moving along surprisingly, giving at present an important outlet for our products. With Great Britain there is now no serious barrier of any kind. The old prejudice against things American is largely broken up. It is a fact that many goods made in England are now sold as American in order to dispose of them more readily. Russian tariff changes are, however, shutting out some goods that had been going to that country in large volume.

A prominent New York export house bluntly alluded to Germany as being in the dumps. Their troubles have arisen from the fact that they put most of their working capital into manufacturing plants and buildings after having discovered they could get trade from England. German manufacturers and merchants borrowed English money for use as working capital. When the Transvaal war came on England called the money back, with the result that the industrial boom collapsed because there was not ready capital enough to properly conduct the business. Germany is referred to by a large export house as having for some time been "the export bargain counter," owing to the necessity of marketing their surplus products. There was one fact to which that country did not give much weight, which was the increasing power of the United States as an export country.

Asia.

CHINA.—The feeling regarding China is that she has not recovered from the recent international disturbances, although the prospects are now better than for the past year. When China's troubles are over and affairs there have quieted down a very satisfactory business is expected, although what will really help commercial relations most is the opening of the country by means of railroads, something of which has already been accomplished in Manchuria and the section dominated by Russian influence.

SINGAPORE, STRAITS SETTLEMENTS, is buying largely Wrought Iron Gas and Water Pipe, but at present all their orders are going to England, and this has been the case for the past six months, because owing to the brisk domestic demand American manufacturers at present will not meet the prices our competitors are willing to make.

PHILIPPINES.—Wilhelmi & Co., 116 Broad street, New York, find that our trade with Manila is developing rapidly under the new order of things. This house have their own representative there in charge of large showrooms with five men to assist him. Orders are coming in in increasing quantities by every mail. Some of the leading articles are canned meats and vegetables for hotels, rubber tired Carriage Wheels, cheap Hardware (cast iron largely), together with general merchandise. Natives are earning more than formerly and spending it.

This concern have shipped quite a number of Bicycles, and have several inquiries for big saw mills and machines for making straw hats. Trade naturally has been held back by the uncertainties of the tariff, a condition that will continue until it is definitely settled, when, if the tariff is satisfactory, it is predicted trade will come in much larger volume. In addition to orders through trade channels, immense quantities of stuff are going out for Government use, which incidentally serves the purpose of familiarizing the natives more or less with many articles produced in the United States that will promote regular trade later.

INDIA.—Several concerns in the United States have sent traveling men there and American goods are gradually growing in favor. There is a much better market for general Hardware, Machinery, Railroad Supplies and cotton goods. A large proportion of our orders for that market come through England, we shipping the merchandise direct and getting remittances via London. Business in India is entirely different from that of the Levant. India is subject to English law. In the event of business disputes the law protects the seller. India is referred to as a coming market for us, and that it is improving all the time. The best trading points are Bombay, Calcutta, Madras, Colombo (Ceylon) and Rangoon (British Burmah). The agricultural people report constantly improving conditions for agricultural machinery. Some of the large manufacturers of that important line are sending their representatives into this territory.

JAPAN.—Japan is poor at present, but the opinion is expressed that when that country settles down financially the United States will increase the volume of business done there. Among the goods we have been sending to Japan are Steel Rails, Machinery, Locomotives, Iron Pipe, Nails and general Hardware.

Australia.

The uncertainty of the tariff, which was finally adopted and made effective October 8, 1901, has had a tendency to restrict Australian purchases for import during the greater portion of the past year, the instrument being adopted as reported subject to such changes as may be thought advisable hereafter. A development of comparatively recent date which seems to have a far reaching importance in connection with Australian as well as other markets is the taking over of the trade in petroleum products, such as kerosene, lubricating oils, &c., by the Standard Oil Company. This great organization several months ago decided to do that business themselves, direct, loading the oil in their own steamers, and at the same time refusing to sell oil here for that territory under their own brands. Following this departure comes the statement that the Standard people have recently chartered a vessel for South Africa, which, in the opinion of a representative New York house, is a sure indication that they intend to control such shipments in the future to that market. The Standard Company are also in the market for a steamer for the River Plate, in South America, and it is currently reported they intend to absorb that market. Still another market they have taken over for their commodities is Portugal. The belief is expressed by those in the trade that the ultimate intention is to ship this important staple in tank steamers to the various outports, load the oil in tank cars in the foreign country where feasible, and so reduce to a minimum the cost of doing the business.

South America

Speaking generally, the American position in South America has improved in regard to exports within the year, but the development of trade is retarded by political and financial disturbances in some of the countries. It is reasonable to suppose, however, in the opinion of representative and large houses doing a considerable business there, that some of these questions

will shortly be settled. As a rule such disturbances, where of an important character, occur at intervals of about ten years, and when ended manufacturers and merchants who want export business will find that they can get just as much of the trade as they will work for and no more. Merchants there with parent houses and close connections in Europe are not going to build up trade for America on their own initiative. They will handle our goods, if American manufacturers will introduce them.

BRAZIL.—The industrial situation in Brazil is, and for a number of years has been, in an unsatisfactory condition, owing to the great decline in their leading products—namely, rubber, coffee and sugar. Rubber has declined in the last few years from \$1.10 per pound to 80 cents. Coffee for five or six years has averaged the grower but 6 to 6½ cents per pound; for the eight or nine years preceding the prices were 15 to 16 cents per pound. In consequence of these declines and the revolution of 1895 the rate of exchange has fluctuated widely. From the time of the old Empire, in 1890, when exchange was 27 pence sterling per milreis (1000 reis), their monetary unit, it declined in 1895 to 6 pence sterling. It has since recovered and is now 12½ to 13 pence. Raw sugar is now lower than it has ever been, having broken the record, it now being 20 per cent. below the lowest record price; thus, in consequence of the decline of their leading products, they have been compelled to economize in their imports. Their importations have been confined to living necessities, rather than the making of improvements. The situation in Brazil is mending, however, and the rate of exchange for paper money is improved, while the general conditions of the country are getting better. While the price of their products has been very low, this has been partially compensated for by the raising of very large crops. Better order is now maintained in Brazil than has been the rule since the republic was established. There is an urgent desire of the people to meet their foreign obligations and control expenditures according to their ability to pay. The opinion of those who are well qualified to advise is that there is a brighter future for this market.

By another excellent authority Brazil is referred to as feeling poor with little real money. Business there is largely done by commission merchants making advances, basing such advances on a certain current price for the products. It has so happened within the last two years that when the commodities were marketed they brought lower prices than was anticipated, consequently the commission merchant did not get back what he had advanced. Previous to this period trade was excellent. The present indications are that the next crop of coffee will be short.

RIVER PLATE TERRITORY.—For the past year business with the River Plate district, the two principal markets of which are Buenos Ayres (Argentine Republic), and Montevideo (Uruguay), is referred to by the leading merchants in that trade as very good. While a general assortment of manufactured goods is sent from this country, leading articles of export are Agricultural Implements, Heavy Hardware, Iron Pipe, lumber, kerosene, and other Petroleum products.

Business with that country, however, is somewhat trammelled by the fact that a reciprocity treaty that had been negotiated by representatives of both governments was rejected by the United State Senate within the year. In turn the Argentine Government has increased duties, which, while not specifically mentioning this country, are nevertheless placed on such wares as originate largely in the United States; the higher rates becoming effective January 1, 1902, having been adopted by the Argentine authorities early in December, 1901. It is thought that this proceeding is in part for the purpose of affording a basis on which to carry forward negotiations in the future, and from which concessions can be advantageously made at an opportune time.

A representative of an American concern manufacturing an important line of Carpenters' Tools, recently returned from Argentina and the River Plate country, says: "American manufacturers have not the slightest

idea of that important market for our goods, or they would cultivate it by sending their own representatives down there to show samples, quote prices, and in a general way promote their particular interests, which cannot be as well done by commission or other export merchants. One feature of such an enterprise would be the studying of their conditions and ascertaining the necessary changes to adapt our goods to their requirements. In this particular case such woods as they have are extremely hard and require special treatment." As a result of the trip referred to, we are advised business in this instance has increased very satisfactorily, and is especially noticeable since the traveler's return. It was no part of the manufacturer's plan to more than introduce the goods and establish the business, leaving to commission houses and foreign representatives in this country the future work of soliciting and handling orders hereafter.

ARGENTINA AND CHILE.—With these countries the business in certain lines of staples which they are compelled to buy from us has been as good as usual, while business of a more general character has been bad. The threatened war between Argentina and Chile concerning boundaries is having a disturbing effect on trade. In case of trouble there is some disposition to think the River Plate section, including Uruguay and Paraguay, may be drawn into it. Late cable advices, however, seem to indicate that an adjustment of the boundary disputes is in a fair way to be settled amicably. Among the leading staples exported from the United States are Plain and Barb Wire, Petroleum, canned goods and other foodstuffs, Hardware, Agricultural Implements, Binders' Twine, lumber and carriages.

ECUADOR.—With Ecuador there is a fair business, but within a month or two there has been financial trouble in Guayaquil, occasioned by the failure of a large house which involved two leading banks there. It is thought that the whole matter will soon be readjusted and matters resume their usual course. The principal articles of export from the United States are Oil, Barb Wire, flour, lumber, and lard, together with General Hardware, glassware and some furniture and miscellaneous goods. Oil, Barb Wire and flour are usually freighted around Cape Horn, lard both around the Horn and across the isthmus, while lumber goes direct from San Francisco.

VENEZUELA.—Our trade with Venezuela for the past year or so has been moderate on account of the unrest and spirit of revolt there. Steamers bound to the principal ports, such as La Guayra, Puerto Cabello, Maracaibo and Ciudad Bolivar, go out quite full, but cargoes consist largely of provisions, such as flour, lard, crackers, butter, some corn and kerosene; necessities that they must have, but there is not much doing in Hardware and kindred articles. The bulk of their importations in Barb Wire, Nails and General Hardware is furnished by Germany, England and France.

SOUTH AFRICA.—Six months ago the trade situation was not favorable in South Africa. A number of concerns there while not actually canceling orders, suspended them, especially in such forms of manufactured wood as are required in the construction of buildings, as doors, window sashes and frames, &c. Orders for Agricultural Implements were also involved. Since then, however, buyers in the United States have received instructions to proceed with the suspended orders, and new orders have been received for prompt execution for similar and allied goods. The business in canned goods, including meats and fruits, has been enormous for the past six months. The general condition of South Africa from the commercial standpoint seems to be greatly improved, and leading houses dealing in that market anticipate a large business in the near future. English merchants do not apparently look to South Africa with much hopefulness, and some of them are apparently preparing to withdraw from it, on account of the remoteness of the prospect of a settled condition of things and the probabilities that for a long time there will be a widespread opposition to English merchants and products. This latter influence is recognized as giving a very favorable opening for American goods.

EASTERN MEDITERRANEAN COUNTRIES.

STRONG & TROWBRIDGE COMPANY, 21-24 State street, New York, have had their own representative, Benjamin O. Hough, in the Levant since last July. He reports the general tenor of trade as very encouraging for American goods, this trip being one of several business visits he has made to the Eastern Mediterranean countries.

TERRITORY NOT SYSTEMATICALLY CULTIVATED.

Generally speaking, this territory has never been systematically cultivated, but while pretty well pre-empted by Germans and English, the former have had the advantage owing to the long credits given by them. The present depressed condition of commercial affairs in Germany, however, operates to keep their merchants from being so keen for business.

OUR TRADE INCREASING

Our business in those countries has grown very fast, and all that is necessary to get orders for American goods is to work it energetically and intelligently. So far, some of the best introduced lines are American domestics (cotton goods), Brown and Gray Sheetings, Drills and Duck. These goods have been shipped from here for years to Greece, Turkey (in both Europe and Asia), Arabia, Syria and Persia.

THE BEST MARKETS.

For this trade our best markets are Smyrna, Salonica, Constantinople, Aden and Hodeida. Some of these points distribute for Arabia, where the people are very poor and use American cotton goods for almost everything in apparel.

SOME IMPORTANT STAPLES EXPORTED.

Turkey consumes a great deal of American Edible greases, such as Edible tallows, beef fats and oleo oil, which mixed as an adulterant with Russian butter sells there at about 9 cents a pound. Cotton Seed Oil is barred in Turkey.

TURKEY BACKWARD IN AGRICULTURE.

In agricultural development Turkey is centuries behind the times, but they have an exceedingly fertile soil. The people are awakening to this fact, and are adopting modern agricultural methods. This house are getting both inquiries and orders for Agricultural Machinery, Plows, Harrows, Mowers, Reapers, Hay Presses and Threshing Outfits. In Reapers, they take the old style, largely, that were popular in America 40 years ago, a reason for which is that they are much lighter and can be operated with oxen, light weight horses and camels.

MACHINERY REQUIREMENTS.

In the line of machinery, this company have recently figured on flour mill plants, saw mill outfits, and such improved machinery as Railroad Drills, Pneumatic Hammers and Calking Machines, Wind Mills and Flour Mills.

BACKWARD IN STEAM FACILITIES.

They have but slight facilities for steam power. The Turks grind cereals very coarsely and eat entire wheat, instead of the fine bolted flours. This company say they believe they could market 100 outfits combining a power wind mill and flour mill for grinding wheat. One of the largest wind mill concerns here, in conjunction with a representative flour mill company, are now making a test to see whether such a combination can be made effective.

INCREASED TRADE IN FURNITURE.

Furniture is another American product that has been taken up in Turkey, the company having sent out 50 Roll Top Desks and miscellaneous furniture, such as Combination Writing Desks and Book Cases.

UNIVERSAL AD VALOREM DUTY OF EIGHT PER CENT.

One of the advantages of the Turkish market is a duty of only 8 per cent. ad valorem on everything from America, and other countries as well, except Roumania, Greece and Servia, on whose products there is a high tariff.

FAVORABLE FREIGHT RATES AND GOOD SERVICE.

Another advantage is in the freight rates, which are now down to a point where we can compete satisfac-

torily. For instance, a fair average for case goods is 25 shilling (\$6) per ton, weight or measurement (40 cubic feet to the ton).

COMPETITION FOR THE CARRYING TRADE.

American steamship lines have awakened to the fact that there is a good trade to get in this part of the world. There are now five American lines from New York to Mediterranean ports, with their own transshipping connections to minor ports. Goods can be landed in Constantinople and Smyrna in one month's time. There is also a new arrangement with the Deutscher-Levant Line that are offering a superior service. The Dominion Line have also just inaugurated a direct service from Boston to Levantine ports with monthly sailings and very low rates.

HARDWARE, LEATHER AND LUMBER.

Some of the goods, specifically of a Hardware character, which Strong & Trowbridge Company are shipping to the territory under consideration, are Bolts and Nuts, Iron, Malleable Iron Fittings, Saws, Builders' Hardware, such as Reading, Sargent and Russell & Erwin make, and Pumps, which are meeting with a very flattering reception. Also lumber (they are figuring on two cargoes at present), cheap jewelry, American leather, for which they got 12 orders in one mail, for the product of some of the best concerns in the United States.

HARDWARE SPECIALTIES.

Hardware novelties especially take their eye; for instance, cheap Coffee Mills, as the Turk is a great coffee drinker. For American Lamps there is a big sale. Sewing Machines sell readily, and gratifying numbers of Bicycles have been sent, although the roads are pretty poor. Also car wheels for tramway systems, which heretofore they have always bought of England and Belgium.

CAR WHEELS AND RAILS.

There is a keen railroad interest in steel rails, the only reason more business is not done just now being that our market is above that of the English and Belgium works.

UNUSUAL INTEREST IN AMERICA.

Mr. Hough finds unusual interest in America and a desire to do business with it, but one drawback has been the desultory effort of Turkish buyers to get in contact with American manufacturers, while our manufacturers have failed to cater to the peculiar character of that trade.

PRICE, NOT QUALITY.

One great point to be borne in mind in considering this market is not so much quality as price. It is useless to urge fine quality to explain a high price. The peasants are poor, and they cannot purchase what is beyond their means. The best chance is in the cheaper lines.

ENGLAND, GERMANY AND AMERICA IN THE EAST.

BY HENRY T. SEYMOUR

AN interesting phase of a trip through Asia is the opportunity to compare the business methods of the different nations exporting to the East, as well as the personality of the representatives of such nations. The principal trading nations in the East are England, Germany and America.

An Englishman in the East

cannot be characterized as "insular." Externally, he is distinctly British; the cut of his clothes, his intonation of speech, his love of sport, betray his origin. But internally, there he is different from his brother "at home." This difference is caused by the conditions of his environment. He is broadened and developed by his assumption of the "white man's burden," by the problems of colonization which he has met and ably overcome. His evolution is analogous in some respects to that of the American from his Pilgrim forefathers. He comments freely upon the inability of the man "at home" to appreciate the difficulties and intricacies of trade in the East, and furthermore his blindness to the fact that English com-

mercial supremacy must now be fought for. He is brought face to face with the fact that old England is no longer the main source of supply on many lines. He sees the Yankees, as we are commonly designated for want of a better name, taking bridge contracts, supplying locomotives, electrical appliances, putting in improved machinery, also metal and Hardware lines, to say nothing of such staples as flour, lumber and cotton goods. Yet, notwithstanding our competition, the Englishman becomes our coadjutor, for he is a keen trader, and will not allow business to slip by. If he cannot follow his natural inclination to order from England he will give his preference to us. He is, as a rule, an able man and a worthy competitor, commanding the respect of both sellers from the West and purchasers in the East.

The German

is alert in the Eastern markets, although, as a late arrival, he is at a disadvantage compared to the Englishman. He is active in Hardware lines, making the cheaper and poorer grades of goods, such as were in past years largely imported into our country, but which are superseded by goods of our own manufacture. It is typical of the German trade that it appears to flourish best in the countries having the poorest population. In this regard the German position is weak, and while the Germans to-day hold a practical monopoly of many lines of low priced goods and enjoy a good share of trade which it would be desirable for us to have, yet there are signs that indicate disaffection.

The Importance of Quality.

Among the Chinese, for instance, one hears the comment: "No b'long proper, no wantchee German," applied to German products. This judgment is final, and is based on experience. It is evident that in many instances the Germans have lost their market by furnishing goods that did not prove to have proper value. We should aim to get our prices as low as possible, but the matter of first importance is to uphold quality. It is a notable fact that the successful exporters in this country to-day are manufacturers whose products are distinguished by their worth. One is impressed by the number of Germans engaged in the export of native products from the East. It would appear from general observation that the Germans are more interested than the English or ourselves in developing the export trade of the Orient. In this way they are serving a good end, as it is a well-known law of trade that the exports of a country tend to balance its imports.

Americans and Their Steady Progress.

As to the Americans, there is not a better or quicker way to arouse one's latent patriotism than to make a trip through the East. In other words, we have little to be ashamed of and much in which we may take a just pride. There are a few regrettable instances in which sharpers have taken advantage of the trust and credulity of the natives, but as a rule our merchants are honorable and the attitude toward our nation is one of growing confidence and of respect.

Our goods are steadily winning their way, as they are essentially practical and low in price on many lines. A Chinaman, purchasing for the first time a standard line of our goods, made the remark: "Remember, ten years from now, when all the trade on this line goes to America, that Ah Ling was the first Chinaman to place an order."

Our holdings in the Philippines are of undoubted advantage to us from the view point of trade, not only from the trade that comes to us from these islands, but because we have obtained a foothold in the East and are ranked with the world powers.

The Expansion Idea

A visit to the East tends to convert one to expansion. If there were any previous need of conversion; not necessarily an expansionist of the blood and thunder type, but a hearty supporter of the policy of the "open door." With a capacity for production already beyond our consumption, it is no longer a question of *may* we export; it is one of *must*. The time is steadily approaching on some lines of manufacture, on others it is now here,

when many of our working people will depend upon the export output for a chance to live.

Other nations have similar and even stronger reasons than we for the necessity of securing and holding foreign markets, as their home markets do not equal ours. It is reasonable that the English and Germans should be agitated at our invasion, and it is to be expected that they will take measures to keep certain of our products out of their countries.

Shackling Trade.

Reverting to the law governing the exchange of commodities, and to the fact that exports tend to balance imports, it is a recognized fact that if we were to remove the shackles on our trade with Cuba both Cuba and ourselves would profit by it. The Cubans are at present largely deprived of our markets. Thus, having less to sell, they can buy less. Their profits from increased sales would give them more money to spend, and a good share of their purchases would naturally come to us.

Again, we have started a tariff war with Russia which has deprived us of a large amount of trade. It is reported that to overcome the high tariff against us certain of our manufacturers are about to erect manufacturing plants in Russia. This tends to take capital away from this country, skilled labor and profits; if the venture proves a success it means the upbuilding of Russia at our expense. Further, it would lead to the further development of similar industries.

There are many changes in view connected with our foreign trade, and, while hasty and radical measures with relation to tariff changes are always inadvisable, it appears that the time is approaching when our opportunity for exporting to foreign nations will depend upon the facilities we grant other nations.

THE AUSTRALIAN FEDERAL TARIFF AND FORMER AUSTRALIAN DUTIES.

FROM OUR MELBOURNE CORRESPONDENT.

FOR the convenience of American traders interested in Australian business *The Iron Age* has just received a tabulated statement, officially compiled, showing a comparison of the present Federal duties with the duties formerly existing in the different States forming the commonwealth. At the time the mail left Australia November 25 the House of Representatives was in committee of Ways and Means for the further consideration of the tariff, but had not reached the section devoted to Metals and Machinery.

Any alterations made in these lines, and many are inevitable, will be duly noted in these columns.

Business generally of late is somewhat tame. Final discussion on the tariff in the Metal and Hardware sections will be at least animated. These sections will not come up for a week of two yet.

As a whole, the duties will stand, but I expect to see changes in the duties respecting Agricultural Machinery and Implements, Machine Tools, &c. In Bar Iron, Steel, &c., it is impossible to say whether the local industry and development of native ores will be assisted by protective duties or the bonus system. I almost expect to see both.

GLASSWARE.—American exporters of Glassware will please note that the duties on packages containing the goods, of which duties *The Iron Age* gave due notice, have been removed in response to strong public opinion on the matter out here. The taxation originally imposed was by the system of cubic measurement over all, plus an ad valorem duty.

Gold Output.

Gold production for the six States of the commonwealth for the first nine months of the year compare with 1900 as follows:

	1900. Ounces.	1901. Ounces.
Victoria	603,987	591,280
New South Wales	263,710	202,607
Queensland	739,470	596,139
South Australia	23,710	23,929
West Australia	1,151,583	1,360,846
Tasmania	45,000	46,177
Totals	2,827,460	2,820,978

The Westralia output increases steadily and the severe drop in Queensland's figures is accounted for by the fearful drought.

Locomotives.

The New Zealand Government is about to test the qualities of American, English and Australian locomotives in order to determine the best pattern to adopt for its railways, and to ascertain the merits of each in regard to saving in the fuel bill.

Traveling Cranes.

Traveling Cranes, Lifting Machinery, &c., are likely to be lines in more than ordinary demand in Australia in the near future. The development of the heavier industries—a development certainly within measurable distance—will fully warrant the expectation.

Port Kemble Harbor Works.

The Port Kemble (New South Wales) harbor works will be well worth watching. These works are for the purpose of developing neighboring coal and iron deposits. The iron ore is said to be rich and coal is at hand for smelting purposes. The New Caledonia ore deposits, concerning which there appears to be a certain amount of secrecy, will probably when worked be brought to New South Wales, if not actually to Port Kemble, for smelting purposes.

Wire and Netting.

Barbed Wire and Galvanized Wire Netting are in good demand, and likely to increase. An active American agent carrying stock here could do much to conserve this trade to your country.

Wire Rope.

Wire Ropes for moving, hauling, hoisting, &c., used in Australia are 90 per cent. of British make. Our annual requirements in this, a mining country, run into hundreds of thousands of dollars, but one scarcely ever comes across American Ropes. Is the trade not worth looking after?

Heller's Rasps, Files, and Farriers' Tools.

Heller Bros. Company of Newark, N. J., have had their representative around Australia of late. Their tools are going to "take on" out here, and they have appointed a good man here to look after their interests.

Automobiles, &c.

As pointed out in this journal 18 months ago, Australia will be a leading market for Motor Cars, which are specially adaptable for the country. Tests are being made now with a view to their adoption by the Postal Department for the purpose of clearing letter boxes, especially for night service, and travelers here and there are adopting them in preference to railway traveling and coaching. They will "boom" sooner or later, and medical and business men, especially those whose incomes are limited, will adopt them as being more economical than horse flesh, and possessing, in addition, the charm of novelty.

CANADIAN TRADE.

Reports from Hardware manufacturers agree that trade with Canada, notwithstanding the preferential Tariff in favor of Great Britain, is in a very satisfactory condition. The following advices from merchants in Canada will be of interest as reflecting existing conditions:

Shelf and Builders' Hardware demand was poor for the first half of 1901 and fairly active the last half. Carriage Makers and Blacksmith Supplies were fairly good all through the year, as there were a lot of vehicles built. Hindrances to trade were slow delivery of orders by makers and too many advances in price; jobbers also are selling consumers much more than they used to and cutting out the retail men. Prices in Canada, especially in Bar Steel and Bar Iron, are inflated, and most prudent merchants are unloading and buying cautiously, as they feel there will be drops all around in Hardware in 1902. Stocks generally are rather light. Collections are only fair, many renewals of note being asked for.

Canada seems to be prosperous and exports have increased considerably. Labor is fully employed and is getting well organized in every line, even day laborers have their union, also carters and teamsters in small towns. Farmers are prosperous; had a good harvest, though grain prices are low. The total yield of all grains in the Canadian Northwest is estimated to have been 85,000,000 bushels. Ontario farmers did not do so well. Money seems to be cheap in Ontario and we have known where money can be loaned on good first mortgages as low as 4½ per cent., although insurance companies, &c., with funds to loan usually ask 5 per cent. There will be some building next year if prices on building material come down to normal.

There was a satisfactory demand for Hardware during the past year. Greater than last year. The chief influence was the improved conditions financially of the farming community. Stocks are fully up to average. Collections are good. We have every reason to believe that business prospects for 1902 are very promising. In this locality there is work for all who desire it. Financial conditions of farmers surrounding us are good.

CASE BROS. CUTLERY COMPANY.

CASE BROS. CUTLERY COMPANY are manufacturers of Hand Forged Pocket Knives and Razors, at Little Valley, N. Y. This business was started in 1895 by Jean Case, John D. Case and A. J. Case, all of whom, however, have been identified with the Cutlery business for the last 25 years. The company advise us that they have secured a force of clever hand forgers, some of whom have worked in the shops of Joseph Rodgers and Geo. Wostenholm's Sons of Sheffield for many years. Case Bros.' Pocket Knives are referred to as forged by hand, and ground by hand in the good old way, thus making a blade with an exceptionally tough, keen edge. The Razors are forged from Bar Steel, each blade being struck more than 200 blows with the hammer. Every customer who is interested in the manufacture of Cutlery is invited to investigate the methods of their work.

EVANS STAMPING & PLATING COMPANY.

EVANS STAMPING & PLATING COMPANY, Taunton, Mass., have purchased the entire plant of the Draper Williams Mfg. Company, manufacturers of Oil Cans and Awls. The Evans Company have moved their steel making department, which was formerly in the Taunton Iron Works, into their new plant, and will continue the manufacture of Nickel Plated Steel Stove Trimmings, which they have been making for the past four or five years. They are also getting ready to manufacture an Oven Thermometer, for which they have secured the patent rights. They will probably be ready to put this Thermometer on the market about February 1. They also intend to manufacture a full line of Stamped Steel Hardware, including Oil Cans.

A. H. FUNKE'S NEW CATALOGUE.

A. H. FUNKE, 101-103 Duane street, New York, has just issued an illustrated catalogue of several specialties controlled by him, among which are the Mannlicher Repeating Rifle, Luger Automatic Pistol, Cllmax Hammerless Shotgun, Full Moon Camping Lamp, Baldwin Searchlights, Baldwin Swinging Yacht Cabin Lamp and the Baldwin and Full Moon Bicycle Lamps, the Lamps and Search Lights all using acetylene.

LOUIS C. PARKER of the Charles Parker Company, Meriden, Conn., and who in the past has been this company's representative in Southern territory, will, beginning with the new year, be in charge of their New York branch, 32 Warren street, superseding James F. Handy, who has been connected with the company for 19 years. Mr. Handy will give his undivided attention to outside interests, with which he has been connected for several years and which now demand his entire time.

THE HARDWARE MARKET IN 1901.

Wire Nails.

Only one change was made in the regular quotations of Wire Nails during the year. This was when prices were advanced by the leading interest 10 cents per keg, to \$2.30, f.o.b. Pittsburgh. This quotation, while not formally changed, was not representative of the market during the latter part of the year, when it became disturbed by new competition. New concerns were soliciting orders for Nails as early as July, and, while actual deliveries were not made by them until fall, it introduced an element of uncertainty into the market. This, combined with the usual summer quiet in trade, did not improve the situation. For a time outside competition was practically ignored, but in the fall the new mills had made such inroads upon established prices that the leading manufacturers found it advisable to protect customers in order to hold their trade. This protection was at first confined to comparatively few points, but afterward became more general. The situation was peculiar, steel being scarce and high in price, while Nails were falling in value. When the slaughtered price represented a cut of 30 cents or more on nominal market quotations a point was reached where the mills who were dependent upon the market for their steel did not appear to care to go lower. The demand for Nails during the year has been very large, although orders during the closing months were, to a considerable extent, for small quantities.

Cut Nails.

At the beginning of the year the price for carloads of Cut Nails was \$1.95, f.o.b. Pittsburgh. In February the price was advanced to \$2, and quotations were made at a delivered price, based on Pittsburgh price, to which freight to destination was added, according to the rate book which was used for this purpose, the purchaser deducting, on settlement, the actual freight paid. Reduced freight rates went into effect February 1, which made delivered prices proportionately lower, but it introduced a confusing element, as the actual freight was lower than that given in the rate book. The confusion and dissatisfaction arising from this method of quoting Nails induced the manufacturers, at a meeting held in March, to make a delivered price f.o.b. Pittsburgh. This action was regarded with favor by the trade. The price was advanced in September to \$2.05, a figure which has since represented the market. The demand for the past twelve months has been moderate, but the strong position held by Wire Nails for the greater part of the year, and the scarcity and the higher price of steel, resulting from the strike during the summer, tended to keep the market fairly steady. The year closes with an unusual condition, in that there is little if any difference in the prices of Wire Nails as compared with Cut Nails.

Barb Wire.

The demand for Barb Wire has been much heavier than in former years, especially in the West, the buying extending far into the fall months. Requirements were so urgent that during the greater portion of the year mills were unable to accumulate any stocks. Quotations have been remarkably even, but one change taking place, that of January 29, when an advance of \$2 per ton was made. During September competition from outside mills began to be felt, and concessions in price were made at competitive points. Shading of prices continued to some extent throughout the remainder of the year, being more pronounced near its close, as demand decreased, but without causing any change in the regular quotations.

Plain Wire.

But one advance was made in the price of Plain Wire during the year, that being an increase of \$2 per ton on January 29. Manufacturers pursued a more conservative course regarding prices than was generally

anticipated by the trade. Demand was very large during most of the year, and mills were most of the time behind their orders. An insufficient supply of raw material hampered them to some extent during certain periods. While the demand from makers of Wire products was good, Woven Wire Fence makers used enormous quantities of Wire. Some unevenness in prices developed in October, owing to outside competition.

Leads.

Manufacturers of Lead products made no change in their regular quotations until late in the year, notwithstanding the fluctuations in the prices of Linseed Oil and Pig Lead, and the irregularities in White Lead in Oil, which were more or less prominent during the last three months. Under date of December 20 the manufacturers announced a reduction of $\frac{1}{2}$ cent per pound in White Lead, dry or in oil, Red Lead and Litharge. In kegs present prices are as follows: In lots of less than 500 pounds, $6\frac{1}{2}$ cents per pound. In lots of 500 pounds and over, 6 cents. The advance on small packages over kegs is the same as before.

Registers.

During the spring and summer months the Register market was in an unsatisfactory condition, with irregularity in prices and a wide divergence in the quotations of the various manufacturers. The competition of comparatively new manufacturers was felt by those who had been longer in the business, and lower prices were made on the common goods, which were the subject of the keenest competition. On September 2, 1901, a new and higher list was adopted by some of the manufacturers. Other manufacturers, however, together with a number of jobbers, continued the use of the old list. At present there is no agreement among the manufacturers in regard to prices, and the situation is not as satisfactory as they would desire. This is a line in which the capacity of the manufacturers exceeds the normal demand, and with the varieties in assortments and quality of goods there is naturally a good deal of unevenness in prices, especially with lack of agreement between the many manufacturers.

Leather Belting.

The most important feature of the Leather Belting market during the year was the adoption by the manufacturers of a new list, on November 12, 1901. This action was necessitated by the higher prices ruling for Belting butts. The new list was in the nature of a general advance on all sizes, the previous discounts remaining substantially the same.

Spirits Turpentine.

The Turpentine market has been an extremely even one, varying but 4 cents between the lowest and the highest price during the year. Prices have been neither very high nor very low. Taking this point as a basis of comparison, for one day each week, Southerners ranged from 35 to 39 cents, and machine made barrels from $38\frac{1}{2}$ to $42\frac{1}{2}$ cents per gallon. As a rule buying has been active when the lower prices ruled, and but moderate on the higher figures. Some time ago a tank company was formed at Savannah, the purpose of which was to erect tanks for the storage of Turpentine, so that the market would not be entirely dependent upon receipts from the interior. The company are about ready, it is understood, to test the matter.

Linseed Oil.

The condition of the Linseed Oil market was unsettled and perplexing during most of the year. The fluctuations in price have been remarkable, July last witnessing the highest point touched for years. Taking New York City Raw Oil in lots of five barrels or more as the basis of comparison, quotations have ranged from 82 cents, current in July, to 50 cents per gallon, which

prevailed in September. In several instances prices advanced or declined 10 cents per gallon within a week.

Paris Green.

Dealers carried over considerable Paris Green from the season of 1900. The price in January, 1901, was 12½ cents per pound in Arsenic kegs or casks. Prices continued until the last of June without material change. The trade were late about placing orders, and the amount of Green sold by manufacturers was somewhat below expectations.

Glass.

The year 1901 opened with the incorporation of the Independent Glass Company, who have had a working agreement with the American Window Glass Company, by which prices have been controlled the greater part of the year. A new list was issued under date of January 21, 1901, by the National Window Glass Jobbers' Association, from which the trade were allowed the following discounts:

Less than car lots.....88 %
Car lots90 %

These prices covered all single and double strength Glass for the entire country. Prices were advanced in March to 85 and 5 per cent. discount in less than carloads, and to 87½ per cent. discount for carloads. In April discounts were made 85 per cent. for less than carloads and 85 and 10 and 2½ per cent. for carloads. In May 80 and 20 per cent. discount was the less than carload price, and 85 and 5 per cent. the carload price. These prices continued in force until about the first of November, when the competition of outside factories and that of imported Glass resulted in a resolution being adopted by the Jobbers' Association permitting jobbers in the various large cities of the country to establish such prices in their districts as they thought would be for the best interest of the American trade. Later in November prices were made 90 per cent. discount for less than car lots from store; 90 and 7½ per cent. discount for carloads from store and 90 and 12½ per cent. discount for carloads f.o.b. factory. These prices were subsequently shaded materially, owing to an attempt to force outside Glass factories into a price agreement, resulting in a demoralized market.

Cordage.

The Rope market has been an unsatisfactory one throughout the year. Demand as a rule has been moderate, and prices have varied a good deal with different manufacturers. The policy apparently has been to secure business regardless of card quotations. Mixed Rope, partly composed of low grade hemp, further complicated the market. Some of this was so cleverly disguised that it was difficult to determine whether it was pure or not. During the last quarter of the year Jute Rope was ordered to a considerable extent as a substitute for Sisal Rope, owing to the high price of the latter. On a basis of 7-10-inch and larger, small lots of Sisal Rope have ranged in price during the year from 6¼ to 9¼ cents per pound; and Manila Rope from 9¼ to 13 cents per pound.

Axles.

The Axle trade in 1901 opened with exceptionally low prices, and declined until it touched a point never reached before, as the result of an open market following a combination for maintaining prices. After September 1, the close of the season, new contracts were made on a better basis, and prices have been advanced generally, covering the higher cost of the raw material. There is a large demand for Axles from all parts of the country, while there is a prospect of a large volume of business for the coming year at fair prices.

Carriage and Wagon Springs.

The year opened with a very active demand for goods, which resulted in advancing prices. Spring manufacturers experienced not only great difficulty in getting stock, but, on account of the advance in price, all customers ordered freely, and those who had optional contracts took the highest limit. The culmination was reached in May, when consumers were freely bidding considerably beyond their contract price for immediate delivery. The

price then declined gradually to 4¼ cents per pound for contracts for the current year, which price has been firmly maintained, although two new concerns have come into the market. Owing to the immense accumulation of orders in the spring the manufacturers were kept busy during the summer, which is usually a dull season, and until specifications of the new year's business came in. This doubtless had its effect in helping to maintain prices. At present the makers are full of orders, with the prospect of an excellent business for the coming year. Consumers generally say they expect to use more goods than ever, and they are ordering considerably ahead of their wants to prevent the scarcity and consequent loss and injury to their business experienced last year.

Carriage Bolts, Machine Bolts, &c.

The year closes with prices considerably higher than in January, there having been a number of slight advances during the year. There has been a large and steady demand, and the volume of business has been such as to tax the capacity of the mills; most of them, during the latter part of the year especially, have been unable to execute orders promptly. Even at the present time most of the manufacturers have unexecuted orders on their books. The condition of the iron market has, of course, given tone to the manufactured product, and the year closes with firm prices and a confident outlook for next year. The condition of the markets abroad has had something to do in diminishing export trade, but manufacturers giving attention to this business give a satisfactory report, and state that they are able to hold in most cases the markets which they have been supplying.

Chisels and Drawing Knives

The general course of prices for Chisels and Drawing Knives has been quite satisfactory to manufacturers. Some factories are now running overtime, and the outlook for 1902 is very encouraging.

Wrought Butts and Strap and T Hinges.

Two advances were made in price during the year, one in March and the other in November, each amounting to about 10 per cent. A revised price-list of Strap and T Hinges was announced by manufacturers under date of March 13, resulting in a somewhat higher list and a slightly larger base discount. The volume of business has been large, and the outlook is promising.

Tackle Blocks.

Manufacturers have had a very satisfactory demand for Tackle Blocks during the year. Orders are referred to as not always as large as formerly, but have been frequent, thus covering a good volume of business. Prices, on the whole, have been better maintained and more remunerative to the manufacturers than in former years. No material change is looked for in the near future. A feature of the trade which has been noticeable is the increase in orders for Blocks of unusual dimensions, indicating a large increase in business and the development of larger enterprises. The materials entering into Blocks have advanced somewhat, and the labor market also is higher. The outlook for business next year is regarded as very satisfactory.

Axes.

The Axe market has been in an unsatisfactory condition during the year, inasmuch as prices have been more or less demoralized. A leading manufacturer early in the season made low quotations, which were promptly met by others, there being a good deal of effort made to secure business even at figures which were characterized as unprofitable. The trade purchased freely, and the volume of business has been good, but prices, both with manufacturers and jobbers, have been low and irregular. The outlook for a large demand for 1902 is favorable, but there appears to be an excess of manufacturing capacity, and in the absence of any agreement among manufacturers the prospect that business will be on a much more satisfactory basis is not regarded as promising.

Iron Rivets.

The price of raw material and the large volume of business during the spring months improved the tone of

the Rivet market, and on April 24 an advance in price was made by the manufacturers. Trade continued good during the remaining months, but prices were not so satisfactory. The outlook for 1902 in point of demand at least is reported very satisfactory.

Tinware, Galvanized Ware, &c.

In Tinware and other sheet metal household goods the feature of the past year has been the question of making deliveries by manufacturers, rather than a question of prices. Demand has been very active, especially during the past six months, and the great difficulty in obtaining supplies of raw material has contributed to the constant shortage of goods, resulting in delays, troublesome alike to merchants and to the manufacturers. A continued large demand is anticipated during 1902, with prices on a firm basis and no lower than are now ruling, with possibly an advance.

Stocks and Dies

Stocks and Dies have been in excellent demand during the past 12 months. While there has been a tendency to low prices, owing to the energetic efforts made by new manufacturers to get a foothold in the market, quotations have generally been maintained by the older and better known manufacturers. The outlook for the coming year is regarded with satisfaction, and a large volume of business is anticipated.

Sash Weights.

The Sash Weight market has been generally strong in price during the year, although some weakness was manifest in the early summer. During the last few months of the year manufacturers worked more in harmony, and the year closed with a better understanding than ever existed before in the history of the Sash Weight business, there being now a marked tendency to put this line on a fair profit basis. Demand has been good and is unusually heavy for this season of the year. There is very little stock in the hands of manufacturers, and the factories are taxed to their utmost to fill orders in hand with anything like promptness. An increase on the business of the past year is expected for 1902. The belief is expressed that when prices for the spring trade are fixed early in February an advance of at least \$2 per ton will be made.

Bright Wire Goods.

The market for Bright Wire Goods stiffened soon after the first of the year, and was characterized by greater regularity in prices. Under date of April 1 the manufacturers announced a new list, an advance being necessitated by the course of the Wire market. Many goods, however, had been purchased by jobbers during the period of relatively low prices, and these were sold at less than manufacturers' quotations. Manufacturers have been generally well employed during the year, and are now busy working on orders for future delivery. Prices are looked upon as satisfactory to both buyer and seller, with a prospect of better spring business than for several years past.

Wire Rope.

Wire Rope prices have been quite firm during 1901 and bid fair to show more strength during the coming year. The volume of business during the past 12 months was satisfactory, and manufacturers are looking forward with satisfaction to 1902.

Saws.

During the past year the demand for Saws has been exceptionally large and prices have been satisfactory. Some of the manufacturers are now three to four months behind their orders. Prices are expected to remain firm, while an advance could be made with propriety, owing to the advance in the cost of labor. The prospect for a heavy business during 1902 is bright, and manufacturers are preparing themselves for it. Stocks of lumber in some parts of the country are very low, which will probably cause lumber operators and saw mill people to run their plants to a larger extent than has been the case in the past year. Coupled with this is the expectation that new buildings will be erected on a more expensive scale the coming spring and summer, if contractors are able to get the necessary material.

Set and Cap Screws.

Demand for Set and Cap Screws has been exceptionally good during the year, and most of the manufacturers have run to their fullest capacity. Prices have, however, been too low, taking into consideration the fact that materials of all kinds which enter into the manufacture of these goods have been high and labor in proportion, the price of these goods being lower at the present time than at the beginning of 1901. The prospect for 1902 business is flattering, with the promise of manufacturers having all they can do.

Wood Screws.

The Wood Screw market at the beginning of the year was in an unsatisfactory condition, with a decided drift toward lower prices. To meet this condition reduced prices were announced on February 1. Low prices brought a large volume of business, which filled the order books of manufacturers. This was subsequently followed by a general withdrawal of extreme quotations, with some of the manufacturers practically out of the market. For a time the tendency was toward higher prices, but with a diversity of quotations by the manufacturers, who were unwilling to accept orders for future delivery. Toward the last of the year prices again became irregular and extras were given freely on desirable orders. Prices throughout the year have been low, compared with those in other lines, while the demand has been large, taxing the capacity of the factories of the leading makers.

Scythes.

At a meeting of Scythe manufacturers, held in September, 1901, a reduction in price was made in accordance with the general expectation of the trade. The agreement entered into between the manufacturers was of short duration, however, as within less than a month the market became an open one, with materially lower prices. Orders have been freely placed for the coming year, which will probably be beyond the capacity of the manufacture to fill. This circumstance has probably kept the market more steady than would otherwise have been the case.

Shot.

The Shot market was more or less irregular up to the middle of the year, owing to outside competition. On July 8 prices were advanced, and throughout the fall quotations were quite firmly maintained. The volume of trade was not what manufacturers desired, the strict game laws of the country being referred to as responsible for the moderate demand. An improvement over 1901 conditions is looked for during the coming year.

Screen Doors and Window Screens.

For the season of 1900 the sale of Screen Doors and Window Screens was in the hands of the Continental Company, and prices were held very high. The early spring of 1900 was cold, which checked the buying of Wire goods. These influences tended to decrease the sale of Doors and Screens during the season of 1900, with the result that factories carried over a large stock of goods into the season of 1901. Prices then settled down to about 20 per cent. less than the prices of 1900, with the result that all the factories sold not only all the goods they carried over, but also all they could make up to July 1. For the season of 1902 the manufacturers entered the market November 1 with the same prices as for the season of 1901. The entire product for the season has practically been sold up, while some manufacturers report a shortage of lumber, and some Wire Cloth factories are refusing orders for 1902. This condition, with the recent destruction by fire of one of the most important plants in the business, would seem to point to a shortage of Screen goods next summer.

Snaths.

While the market for Snaths is practically an open one, manufacturers seem to have worked together with a considerable degree of harmony. The cost of manufacturing the goods is alluded to as not permitting any reduction in prices which have been current.

Steel Goods.

The Steel Goods season begins with the manufacturer on August 1. In 1901, up to August 15, the Steel Goods Association was in operation and manufacturers' prices were maintained at the list and discounts established in August, 1900. The prices of the manufacturers were well maintained by the jobbers in some parts of the country, but were cut considerably in other parts. The jobbers bought sparingly and the aggregate sales to them by makers in the association were materially less than in preceding years. Many of the manufacturers carried heavy stocks into 1901. The stocks of jobbers in general were light. Some new plants for the manufacture of Steel Goods were started in 1899 and put a considerable quantity of goods on the market at prices below those of the association. In August, 1901, the Steel Goods Association practically dissolved, and manufacturers entered the market with no agreement as to list or base discounts. Since then the market has been irregular, with a downward tendency, until November 1, when prices had reached a very low level, and many of the manufacturers' order books were filled up. Some of the leading makers had withdrawn quotations by December 1, had advanced prices and were declining orders. Certain grades of goods can, however, still be bought at extremely low prices. The business prospect for 1902 is excellent, with the probability of an excessive demand during the spring and summer.

Tacks and Brads.

Prices of Tacks and Brads during the year have been low, rather than otherwise, but have netted some of the manufacturers a normal profit. In volume the business has been satisfactory. There has been considerable diversity in the quotations of Wire Brads by various manufacturers, but prices have been generally steady, with some recent advances on account of condition of raw material market and a better understanding between some of the manufacturers. Stocks are low in the hands of jobbers, and the indications are promising for a large trade in 1902.

Coil Chain, &c.

The past year has been notable because of the few changes which have taken place in price of Coil Chain and the evenness of the market generally. The manufacturers pursued a conservative policy in the matter, maintaining a steady but equitable price, based upon the cost of the raw material. Prospects for 1902 are flattering and an advance in price is a possibility, as manufacturers will have to make new contracts for material at current prices. The export demand has been good and promises to be better this year. A revised price-list of Bright Chains, including Traces, Breast Chains, Cow Ties, &c., was announced shortly before the middle of the year. The revision was made with the idea of securing more uniformity between English sizes and Western standard sizes. In October manufacturers of Wire Coil and Halter Chains issued a uniform price-list of these goods.

Sad Irons.

Prices for Sad Irons have been well maintained throughout the year, with a good volume of business. At the present time the market is very firm and the outlook for 1902 is promising.

Wood Planes.

Business in Wood Planes during the past year was very satisfactory to the manufacturers, both as to volume and margin of profit. It is confidently expected that these conditions will also characterize the trade of 1902, and that prices will continue without important change.

Carriage Bolts, Machine Bolts, &c.

Frequent advances were made by the Bolt manufacturers during the year, which were well maintained. They were the outcome of the condition in the market for the raw material and the heavy demand. Most of the time the manufacturers were behind their orders and there was a scarcity of goods. Export business during the 12 months was large. At a meeting of the

manufacturers held last week former prices were confirmed, only slight irregularities being reported. All the indications point to a large and satisfactory trade during 1902, especially if the price of iron and steel is not advanced.

The Rubber Goods Market.

The activity of the Rubber goods factories, in the lines most nearly related to the Hardware trade, during the past six months, would indicate that the demand for their products has been exceptionally good. Under such conditions, manufacturers and dealers, as a rule, are better able to maintain prices than when the demand is irregular. One good indication of the condition of the Rubber industry is the extent of the imports of raw material. During the past year the receipts of crude Rubber in the United States have been the largest on record, a condition which, in view of the fact that the production of Rubber increases only at a moderate rate, might have led to higher prices of the raw material, but for the fact that the European consumption has fallen off. The British Rubber trade has shared the general unfavorable effect upon industry of the war in South Africa, and Germany is experiencing a period of depression which is felt in the branches which call for Rubber goods. Hence the price of crude Rubber in the United States has declined slightly all year.

If this tendency should continue, it might, before long, mean lower prices for Rubber goods, but business depression has been felt also in the great Rubber producing districts of South America, and there are those in trade who confidently look for a falling off in the output of crude Rubber this winter in consequence. Of course, Rubber goods cannot be expected to follow closely the market for the chief raw material. Much Rubber is bought for future delivery, and the manufacturer at any given date may be using material for which he paid more than the rate prevailing at the moment. Again, the manufacturer figures the cost of his goods on the average value of crude Rubber, and when that commodity is low he has a chance to make a profit on Belting, Packings and Hose to offset the unfavorable effect upon his business of higher priced Rubber at another period.

At no period in the past has there been apparent in the United States so much work in the extension of Rubber factories, increase of capital and the employment of additional labor as during the past year. While there have been several new concerns organized, it is worth noting that the increases referred to have been more in the growth of long established and substantial concerns, such as would hardly add to their capital if there were not in sight good indications of increasing business. The prospect of a growing export trade in Rubber goods has not been without its effect, but more important than this is the increasing purchasing power of our own population, as a result of which important new stores are coming into existence, and manufacturers are establishing branch houses in trade centers now important, but which hardly existed on the map a generation ago.

The demand for Rubber Belting for the single purpose of equipping new grain elevators is an important item. Every additional steam engine set to work adds to the demand for Packings, and Air Brake Hose, Garden Hose, Fire Hose, Brewers' Hose and other goods in this class are constantly being used in a wider field. Besides, every order for goods needs to be duplicated, at an interval governed by the quality—and consequent durability—of the original supply. The production of all kinds of Vehicle Tires of Rubber goes on apace, adding to the country's requirements of Rubber, and to the activity of the factories, besides serving to keep up the price of the raw material.

The advance in price of Leather Belting in November will have its effect in stiffening the prices of Rubber Belting, though not of advancing lists on goods of this class.

The Rubber Shoe industry is more active this year than for two seasons past, owing to the winter having opened with weather more favorable for this trade. It is true that the great competition, due to the large number of factories in this branch, leaves little opportunity for profits on the business done, but none the less the

demand for raw Rubber is stimulated, with the effect of keeping up its price.

Again, there are rumors of a further combination of Rubber manufacturing interests, and also of the trade in crude Rubber. But such rumors are heard periodically, and the experience of such concerns as form the existing combinations in the trade has not been such as to appeal to others to adopt a similar programme. Thus, after a consolidation practically of the whole Rubber Shoe industry, only a few years ago, there are more independent Rubber Shoe manufacturers in the country today than existed before the "trust" was formed—and they are doing a large volume of business. As for Belting and other "mechanical Rubber goods," a competent superintendent can always be secured, put in charge of a new plant, and set to work supplying a few big jobbing houses that would rather buy from an independent source than from a monopoly, even at the same price. But, somehow or other, the small, independent manufacturer generally seems to undersell the larger concerns, and in time becomes a large concern. Any monopoly of crude Rubber seems about as feasible as cornering the world's resources of iron. The Hardware trade need not be concerned, therefore, about any possible prospective effect upon prices of any attempts to bring the Rubber industry under a narrower control than at present.

Pumps.

While there has been no formal agreement between all the manufacturers of Cistern and Pitcher Spout Pumps, their relations for some months past have been more harmonious than usual. Some reductions were made in the price of Pitcher Spout Pumps as compared with those ruling during the early part of 1901. The volume of business during the year was excellent. The outlook for the first six months of 1902 is regarded with satisfaction, and manufacturers are looking forward to a large trade. It is not unlikely that some advance will be made in quotations on Pumps, if the price of iron should move upward.

Twist Drills.

Prices for Twist Drills have been quite steady for some time, and there is no reason for apprehending any immediate change. The outlook for the coming year is regarded as favorable, in view of the activity in all lines of manufacture. Export business in this line has been very much crippled by the action of the Secretary of the Treasury in regard to the duties on sugar, the Russian Government having imposed an extra import duty on this class of goods as an offset to the action of the United States authorities. Business throughout the German Empire has also fallen off, chiefly because of the very hard times which prevail in that country.

Sandpaper.

Business in Sandpaper has been of good volume during the year. Prices for the ordinary goods have, however, been low, owing to the severe competition which has characterized the market. The cost of raw materials, on the whole, has increased, and labor and supplies are also higher than in 1900. For 1902 prospects are excellent for a large demand, as all lines using Sandpaper are busy. No further depreciation in prices is looked for until existing conditions change materially.

Screen Wire Cloth and Poultry Netting.

Early in 1901, 90 cents was readily obtainable on good orders for Screen Wire Cloth, and the price on small lots purchased by retail merchants ranged from 95 cents to \$1. As the season advanced the market became firmer and in April the difficulty of obtaining goods as promptly as desired caused prices to the retail trade to advance to \$1 to \$1.10. Indications point to a scarcity of Screen Wire for the season of 1902. About March 1, 1901, manufacturers withdrew the low outstanding quotations on Poultry Netting, and named slightly higher prices. While the great bulk of the Netting had been purchased for the season this action imparted more firmness to the market. Prices were, however, low and yielded little profit to the manufacturers. During the past two months, however, an improvement in the tone of the market took place without any formal agreement on the

part of the manufacturers, and a price 5 to 7½ per cent. higher for next season's delivery has been generally maintained. The prospects for the new year are considered encouraging.

Lawn Mowers.

Stocks of Mowers in the hands of the trade are low, as comparatively few were carried over from last season. Orders are being placed freely with manufacturers for next season and in somewhat larger quantities than last year. Orders on the books of some manufacturers are, in fact, largely in excess of those of 1901. While there is still a large demand for the cheap grade of Mowers there is a perceptible tendency toward better goods. Competition between manufacturers is keen, which keeps the margin of profit down. The market for the best class of Mowers is firm. On cheap grades manufacturers are making slight concessions from regular quotations to secure desirable orders. The price of this class of goods is somewhat higher than in 1900, owing to the higher price of iron and advance in the cost of labor. The outlook for a large demand for Mowers in 1902 is reported as excellent.

Horseshoes.

Not for many years has this trade been as satisfactory in almost every respect as during the year now closing. As is well known, all the manufacturers save one have been working under some sort of an agreement which has evidently proven entirely satisfactory, as it is understood to have been renewed for another year under the same selling conditions as to quantity, rebates and discounts, as now exist. The associated manufacturers have shown their conservatism in that with a constant advance in their cost of production, and a demand that for at least the past six months has been almost unprecedented for their goods, they have resisted the temptation to advance prices and the year ends with the prices adopted last January. With the exception of favoring a small advance in a few specialties, that cut little figure in the general trade, some of the leading producers oppose any change from present prices, but if any is made it will, in conformity with past usage, no doubt be announced some time in January. Export trade has not received much attention during the past year, owing to the large home demand. A serious difficulty in this trade is the fact that every foreign country is wedded to its peculiar patterns, which necessitate special Rolls, Dies, Formers, Creasers, &c. The orders being mostly for sample lots, manufacturers do not care to incur the large expense involved in filling these small orders, especially with a home demand for regular patterns that keeps them busy. The outlook for the new year was never brighter. With empty bins at the works and the stock in jobbers' hands reduced to a minimum, with prices that are low enough to be attractive to the consumer, the prospect is that the manufacturers will be kept busy during 1902.

Building Papers.

Building Papers, including Rosin Sized Sheathings, Water Proof Sheathings, Asbestos Paper and Board, Deafening Felts, Tarred Roofing Paper, &c., were in excellent demand during the spring and fall seasons. The market has been an open one, and prices have ruled low owing to active competition. Raw materials incident to the manufacture of Asbestos Papers have not declined in proportion to the selling prices of the finished product. The prospect is not encouraging for higher prices in the near future, but indications point to a large demand for 1902. It is not thought that there will be any reduction in prices of Asbestos Paper next year, or at least during the first part of the year, and that quotations will be higher rather than lower. There is a large demand for Asbestos Building Paper, which is expected to continue.

Heavy Hammers and Sledges.

Prices of Heavy Hammers and Sledges, while without entire uniformity during the spring, held quite firmly on account of the increased cost of the raw material. During the third quarter of the year the market was characterized by a strong tone, and an advance of 10 per cent. was made in price. Manufacturers are enjoying

a good business, and the outlook is for a continuation of present conditions.

Files.

The past year was a very satisfactory one as regards the demand and the quantity of goods sold. Prices, while firmer than during 1900, were considered low, as they were not raised in proportion to the advance in raw material. A heavy business is looked for, at least during the first six months of 1902, without change in prices. The principal feature of the File market was the purchase by the Nicholson File Company early in the year of several important File factories, which did away with some of the irregularity in this line and diminished competition, thus exerting a beneficial influence on the market generally.

Wrought Iron Pipe.

During the second week in March, 1901, practically all options on deliveries or shipments of Wrought Iron Pipe after April 1 were withdrawn. At this time there was a noticeable scarcity of leading sizes of Pipe. The market continued firm with active demand up to the fall months with increased scarcity, owing to the then existing labor difficulties. During this time most of the Pipe obtainable was procured from jobbers, at a large advance in price. The general outlook for business in Wrought Iron Pipe during the coming year appears promising. A number of new concerns are about entering the field, however, and keener competition may result.

Picks and Mattocks.

Prices of Picks and Mattocks have ruled low during the greater portion of the year, but within the past few weeks an improved tone has manifested itself. There was a heavy demand during the year, but inability to procure the raw material militated against the prompt filling of orders. Indications are for a large trade during the coming season, some of the manufacturers having enough orders on their books to keep them busy for several months.

Cast Iron Soil Pipe and Fittings.

The formation of the pool for the control of the price of Cast Iron Soil Pipe and Fittings, organized during the first week in December, 1900, was soon followed by an advance of about 10 per cent. in price. All sales were restricted to those for immediate shipment and no orders were accepted for shipment after December 31. On January 8, 1901, prices were again advanced and the new year found the jobbing trade with very low stocks, placing the manufacturers in control of the situation. A new price-list went into effect all over the United States on February 25. The country was divided into territorial districts in which prices and terms were fixed for the regulation of sales, and in which discounts differed. The consumption of this line of goods has been large during the year. The market is very firm at the present time, manufacturers preferring to carry their stocks through the usual dull season rather than dispose of them at concessions in price. A large trade is anticipated for the coming year, as it is expected that a good deal of building will be done over the country generally. The capacity of the foundries is large and in excess of the normal demand, and without agreement between them manufacturers' prices would easily become demoralized in presence of a dull market.

Shovels and Spades.

The associated manufacturers have during the year been in almost complete control of the market, and their prices have been steadily and regularly maintained except in the Hollow Back and some special goods, in the introduction of which outside competition has been particularly active. New manufacturers have been entering the field in considerable numbers, but in most cases with only limited lines of goods, comparatively few of them offering a complete assortment. An important event of the year was the formation of the Ames Shovel & Tool Company in August, in which the interests of a number of the leading manufacturers were consolidated. This does not interfere with the working of the association, which, especially in view of recent arrangements made to control the principal outside concerns, closes a

very successful year in an excellent position. Competition with the associated manufacturers is, however, steadily growing, but it remains to be seen what effect the low prices made on Hollow Back Goods, and the inducements offered to jobbers to confine their purchases to the association, will have on the situation. The volume of trade for the coming year will probably be large, but its features will obviously depend upon conditions which it is too early as yet to forecast. A very hopeful feeling prevails.

THE CHICAGO HARDWARE TRADE IN 1901.

All branches of the Chicago Hardware trade enjoyed a volume of business in 1901 far in excess of that of any previous year. Their profits may have been larger in the boom year of 1890, when much benefit was derived from the rapid advances in prices of iron and steel, which carried with them corresponding advances on manufactured goods in stock or under contract. The year just ended was not marked by any great advances except on Sheets and Tin Plates, but the course of prices in general was upward and the firm condition thus existing had a marked effect in influencing buyers to place orders. Having more confidence in the maintenance of values, they at all times felt free to lay in ample stocks to meet the requirements of their trade. It was a year in which the element of speculation played a very small part in purchases of Hardware. It was therefore a year of healthy trade, with good legitimate profits to all interests. Nothing happened during the entire period to seriously curtail the volume of business or to cause such apprehension of the future as to check trade. It was a year free from political and financial disturbances. The crash in the New York stock market in May had no effect whatever in the Hardware trade. The great drought in the West and Southwest during the months of June, July and August, which heavily reduced the crop of corn, was apparently only an incident in current events, and although it was almost a calamity in some localities, yet it was of no effect in depressing the Chicago Hardware trade. The huge wheat crop and the high prices ruling on all cereals offset to a great degree the losses occasioned by the drought. The general condition of the West was so satisfactory in every respect that the shortage in the corn crop was endured very easily. It evidently required something much more serious to abate the remarkable business activity which even during that period and since then has characterized the West. The great strike in the Sheet and Tin Plate mills of the United States Steel Corporation which occurred in July, August and September greatly interfered with the even current of trade. It cut off considerable business in these products which would otherwise have been secured, and at the same time created a condition of harassing annoyance growing out of the custom of placing orders during the spring months for fall delivery. It was utterly impossible for the Chicago jobbers to fill more than a small percentage of the business thus entered, and they were constantly besieged by their customers who insisted on their contracts being filled. The scarcity of Sheets and Tin Plate caused a shortage in the supply of a large line of Hardware into which these products enter. Much more business would have been done if stocks of such goods had been available to meet the heavy demand. These are the only really adverse circumstances with which the trade had to contend. On the other hand, the year was characterized by great activity in building operations, not only in Chicago, but throughout the Northwest. The Chicago building trade, which had been almost paralyzed the preceding year by labor troubles, was free from any disturbances of this character in 1901. Many building projects which had been deferred were then carried out, and the demand for Builders' Hardware and Mechanics' Tools of all kinds was larger than for many years. The trade through the year was of a remarkably steady character, suffering little interruption during midsummer and other portions of the year which are ordinarily expected to show a quiet condition of business.

January opened with an exceptionally good demand for the month. Orders began to be received by mail in advance of the departure of the traveling salesmen from headquarters. These orders covered practically the entire line of Hardware, indicating that dealers felt the necessity thus early in the year of enlarging their stocks. Very few changes in prices were made. The general range of prices was fully 30 per cent. below the level ruling at the corresponding time in the previous year. It was thus seen that the volume of business would have to be considerably increased in order to show the same results in the value of the goods handled, but it was speedily observed that trade conditions might be relied upon to swell the volume to the proportions necessary to make this comparison a favorable one. Orders for new stocks were numerous. Flattering reports were received from all parts of the territory tributary to Chicago. The statement was made that some towns were absolutely without a vacant store for the first time in ten years. The weather during January was sufficiently mild to enable a great deal of outdoor work to be prosecuted. An advance of 10 cents in the price of Wire Nails and Barb Wire, made on January 29, which came quite unexpectedly, stimulated business decidedly. It caused dealers who were uncertain regarding the maintenance of values to quickly decide that other prices were likely to be advanced. February was a month of quite severe weather and caused a heavy demand for all kinds of seasonable goods. During this month manufacturers began to advise the trade that their orders were such as to cover their capacity for months to come and further advances were anticipated. These were shortly realized by the marking up of Wire Cloth 10 cents, Poultry Netting 10 per cent., and Light Sheets \$4 per ton. These advances caused still heavier trade, and during February and March jobbers found their trade about as large as they could conveniently handle. In March miscellaneous goods, such as Picks, Mattocks, Wedges, Strap Hinges, Barn Door Hangers and Sheet Steel Goods, were marked up, and this action imparted a still stronger feeling to the trade. Dealers began to place orders for fall delivery, fearing that they might be unable to secure winter goods unless they took early action toward covering their requirements.

The second quarter of the year found the volume of business unprecedented. Jobbers were frequently obliged to work their packing forces at night, and were also compelled to greatly increase their help and in every other possible manner endeavor to expand their facilities to handle the heavy trade pouring in on them. This condition of trade was not checked by inclement weather or the bad condition of country roads, which during previous years had often operated to disturb spring business. The freight houses of the local railroads for the greater part of this quarter were absolutely congested with merchandise of all kinds awaiting shipment, their transportation facilities being inadequate to the heavy pressure of goods for shipments. The city business showed remarkable gains over previous years, due to the activity in the building trade. About this time the Government issued reports showing a very promising condition of winter wheat, which gave all Hardware and other business interests increased confidence in the future buying capacity of the West. Stocks of goods in Chicago were drawn upon by jobbers in other cities, who were finding it difficult to secure satisfactory shipments from the mills. The trade had special trouble in securing a supply of Smooth and Barb Wire, Woven Fencing and Poultry Netting. The largest manufacturers with their enormous facilities were unable to give anything like satisfactory service. While April showed a heavy increase in the volume of business over March, so May showed a still greater increase over April, and brought with it even more difficulty in securing Wire Products, Sheet Metal Goods and even Mechanics' Tools. Some of the most ordinary classes of Mechanics' Tools, as, for instance, Screw Drivers, were in scant supply. June began with unseasonably cold weather, which caused some slackening in the demand for summer goods, and for a time the indications pointed to a check

in the flowing tide of business. This changed by the middle of the month and a period of hot weather set in, which completely reversed the condition of affairs and brought about an exceptionally heavy trade in goods of this character, while in the meantime the demand for Builders' Hardware and staple goods poured along in an unceasing stream.

Some of the Chicago jobbers were compelled to work their packing forces at night during the Fourth of July week, which was unprecedented in the history of the local trade. The price of Light Sheets was reduced in July, but this was without any effect, as the stock of Sheets on hand was so small that the trade were practically unable to get any Sheets at the reduced price. The reduction was made in the face of the fact that the Sheet mills would be closed for some time on account of the labor dispute between the United States Steel Corporation and the Amalgamated Association of Iron, Steel and Tin Plate workers. The prices of other products showed a tendency to advance rather than decline. It had been expected that by this time the enormous business in Wire products would show some diminution, but greatly to the surprise of the entire trade the demand kept up not only for Wire Nails, but for Barb Wire and Woven Fencing. The great drought, which had begun in June, continued throughout the whole of July, and while it was without effect on the winter wheat crop and only slightly damaged the spring wheat crop, it was known to have a serious effect on corn and apprehension was entertained that the shortage in this crop would cause a serious falling off in business. Much to the surprise of all the Hardware interests, the months of July and August showed a continuation of heavy trade, even in the localities most afflicted by the drought. The month of August made a wonderful record. Business even then was hampered greatly by difficulty in securing goods to fill orders. At this time scarcely an invoice was sent out which did not show a number of shortages placed among back orders. Both August and September witnessed increasing annoyance throughout the trade, because of the short supply of Sheets, Tin Plate and Wire Goods. Notwithstanding the shortage in such goods the volume of business maintained its stately proportions. Even the shock of the President's death had but a momentary effect in checking the activity of the trade.

The last quarter of the year brought with it no influence to reduce the current of good trade. The unusual fact was noted that unseasonably warm weather in October was welcomed, as it caused a break in the heavy demand for winter goods, which was then running beyond the ability of manufacturers or jobbers to supply. It was absolutely impossible to accumulate any stocks in any of the staple lines of goods, even though the strike in the Sheet and Tin Plate mills had been settled in September. Continued scarcity existed in all manufactured products depending on Steel Sheet Metal, practically up to the close of the year. A great shortage was found in Stove Pipe, Elbows, Coal Hods, Stove Boards and related articles. The demand for Mechanics' Tools and Builders' Hardware kept up steadily during these months. Although some diminution in the volume of business in December was observed as compared with November, nevertheless it proved to be much in excess of the corresponding month of any previous year. The outlook for the coming year is very bright, and from present appearances at least six months of heavy trade are assured. It is not expected that manufactured goods will be in such short supply as last year, as the capacity for production has been greatly increased, and no apprehension of labor troubles now exists.

Chicago Wire Nail Prices.

The course of prices of single carload lots at Chicago during 1901 and for several years preceding is shown in the following table, the monthly prices being averaged from weekly quotations in our market reports:

Months.	1901.	1900.	1899.	1898.	1897.	1896.	1895.
January.....	\$2.35	\$3.53	\$1.59	\$1.55	\$1.50	\$2.42	\$0.95
February.....	2.45	3.53	1.73	1.57	1.45	2.42	.95
March.....	2.45	3.53	2.09	1.55	1.50	2.57	1.00
April.....	2.45	3.28	2.25	1.47	1.45	2.55	.95
May.....	2.45	2.53	2.35	1.45	1.42½	2.70	1.10
June.....	2.45	2.18	2.60	1.43	1.42¼	2.70	1.50

July.....	2.45	2.43	2.70	1.36	1.35	2.70	1.95
August.....	2.45	2.43	2.80	1.36	1.37½	2.70	2.20
September.....	2.45	2.35	3.10	1.45	1.50	2.70	2.40
October.....	2.42½	2.35	3.20	1.47½	1.52½	2.70	2.40
November.....	2.35	2.35	3.28	1.40	1.50	2.70	2.42½
December.....	2.25	2.35	3.53	1.37½	1.50	1.60	2.42½

Average for
year.....\$2.41 \$2.76 \$2.60 \$1.45 \$1.46 \$2.54 \$1.68½

Chicago Barb Wire Prices.

The course of prices of Galvanized Barb Wire, in single carload lots, Chicago delivery or equal, has been as follows in 1901 and several years preceding, our weekly quotations being averaged:

Months.	1901.	1900.	1899.	1898.	1897.	1896.	1895.
January.....	\$2.95	\$4.13	\$2.05	\$1.90	\$1.90	\$2.02½	\$1.90
February.....	3.05	4.13	2.25	1.90	1.85	1.97½	1.90
March.....	3.05	4.13	2.62½	1.90	1.90	1.95	1.95
April.....	3.05	3.88	2.80	1.87½	1.80	2.05	1.90
May.....	3.05	3.13	2.95	1.80	1.80	2.15	1.95
June.....	3.05	3.13	3.20	1.80	1.75	2.00	2.10
July.....	3.05	3.10	3.30	1.80	1.75	2.00	2.15
August.....	3.05	3.10	3.40	1.80	1.65	1.90	2.55
September.....	3.05	3.00	3.67½	1.80	1.80	1.85	2.85
October.....	3.05	3.00	3.77½	1.82½	1.80	1.85	2.85
November.....	3.05	3.00	3.88	1.82½	1.80	1.85	2.85
December.....	3.00	3.00	4.13	1.82½	1.80	1.95	2.00

Average for
year.....\$3.04 \$3.39 \$3.17 \$1.85 \$1.80 \$1.96 \$2.25

Chicago Cut Nail Prices.

Cut Nail prices were remarkably uniform throughout the year, being \$2.35 for small lots from jobbers' stocks in January and \$2.45 for the entire year thereafter, thus making the average for the year about \$2.34, as compared with \$2.48 for 1900.

WHAT TO DO IN JANUARY.

BY H. C. W.

THE first month of all the 12 to follow—the month of new resolutions—the month of changes and that one which decides for us the result of the inventory as to whether we have made a dollar in the business or see staring us in the face the fact that we have lost many of them.

After closing inventory books, after the dividend, if any, and after closing every possible account on the old books, it is a good time to get ready for

That New Set of Books and Collections.

No time is quite so good as the first of the year to start the clerical department entirely new, as to material to be used. There are many good reasons for it. In the first place every one expects to pay his debts, if he pays at all, at that time. It is more convenient for him—as a rule he has more money, and he well knows it is expected of everybody.

This season should lessen by almost hundreds the number of accounts to go into your transfer to a new and clean ledger, and a little printed pasteur slip put on your statement, to the effect that you are changing, will aid greatly in the collection of them. Something like this, which the writer has used to good advantage:

The New Year is at hand, we expect to open an entire new set of books; will you very kindly help us in this by favoring us with amount of above account?

Many people who would not ordinarily respond, knowing and appreciating the attending labor, will make it a point to see the account paid.

Now, as to your books. If possible at all have them made to suit your wants, particularly ledger and cash book. Many bookkeepers and many proprietors prefer special ruling of ledger, and it costs no more than to buy made up or shelf goods.

In a special column cash book—that is, one in which the columns are ruled for Freight, Drayage, Interest and Discount, Merchandise, Expense, &c.—a great saving in time is made and endless waste of pages in the new ledger are avoided. The matter of simplifying and shortening is a great item where many accounts are carried.

January the Time for Changes

There are frequent changes in firms at this season, but the minor changes in store room and arrangement are more particularly referred to. You have, perhaps, more

time at your command during the first two weeks of this month for such work than at any other season of the year. It is neither pleasant to the eye nor profitable to keep the same arrangement of your store running from year to year. The appearance of the store must be the loadstone to attract, and customers tire greatly of an everlasting sameness, and are very liable to make the assertion that you are drifting into what is termed old fogysm.

It costs so little to change the arrangement, the placing and filling of showcases and to add new ones where and when needed, and practically just as little for fresh paint and bright, attractive shelving. The addition of a wall case occasionally adds wonderfully to the appearance of a room. Let every effort that is made in this line tend toward the showing of more goods and making the silent salesman. A line of goods such as Hammers and Hatchets or Saws will sell themselves when exhibited in a case, while on the other hand customers will not ask for them under any circumstances unless their errand be directly for that article.

A New Set of Rules

for employees, if your old ones do not meet your views or have not been observed as they should be, or perhaps you have gone along without any.

Men do not object to sets of rules in a store unless they be extremely arbitrary ones—on the contrary, they prefer working under a system that tells them when and where and what to do without the continual asking, and beyond what their own intuition would dictate.

In the case of but two or three employees it may be thought not worth the trouble, but the writer assures you that few or many sensible right lines laid down for their direction are appreciated by the men themselves and the results are greater and much better than where none at all exist.

A little system is a help to the green man and a law to the older one, saving proprietor, too, many moments of anxious worry during the day.

How About Advertising?

Has yours been a success during the past year? Have you bought space and handled it as you would the buying of goods you put on your shelves? Do you get more out of locals than you do out of display, or have you watched the results of either?

Are you using good cuts or putting up the same old ones you have had for years? Do you make frequent changes, and do you confine yourself as nearly as possible to one line of goods in advertising, or jumble many together? In the latter case of course the real object of your work is lost sight of and much of it goes for naught.

We should ask ourselves fairly and honestly these questions and look the matter of our advertising squarely in the face. More money is thrown in the fire through poor advertising and little attention to it than any of us can estimate.

Do you advertise at all? Many Hardware merchants do not. If not, get at it and see the difference in your business. You will wonder where all the barnacles came from that will drop away as you sail along with increased trade.

Money in New Lines of Goods,

and there is money in them. January is a good time to decide what they are to be. It's very much like your old shelving and your showcases that are never changed as to arrangements and contents; people get tired of seeing them, and in these hustling days are looking for new lines. You will have had continual calls for some one class of goods you do not carry—perhaps House Paints, Box Paints or Brushes—all profitable goods, perhaps more so than you imagine. It takes but little capital to add them, and in doing so it is not necessary to sell the worthless Paints—the man who doesn't pay his debts is a part of every class of trade. You will find there are great quantities of these lines you have not carried, sold all the time and at a good profit and for cash.

Enameled or Gray or Blue Ware is a great seller. Hollow Ware is good, Carpet Sweepers, Fishing Tackle and Sporting Goods in a small way. Put in lines that

competitors don't handle; there are any number of them and they attract customers.

Lest We Forget,

and what should be the first thing in the new month, don't neglect to see the carried over holiday goods, that positively do not sell during the year, put away safely and put away dust proof and dirt proof. For a great many goods paper bags are capital for this. Some of it can go along through the month with the chance of selling it, but the time comes for Fire Irons, Brass Sets, Candelabra and Candle Sticks, Brass Fenders, Brass Hods and all the smaller pieces of plated, brass and bright goods, and their value gets away unless properly wrapped and bagged and packed in a clean, dark corner.

Start with a Clean Store

This month and the new year should see every part of the store spick and span and clean as clean can be. Of course, the inventory helps much if carried through rightly, but all of us do not clean up thoroughly as we go, while it is a fact that every man doing calling off should have a brush or feather duster near at hand, and not depend so largely on an after going over, for which time and opportunity may never come.

It is wonderful the amount of filth, &c., that gathers during the year on shelves, in boxes and throughout every corner of a Hardware store, and the time to clean up rightly is early in the first month of the year.

The Opportunity for Clearing Dead Stock

is in January. No other month gives you the same, and in no other month of the year, perhaps, is there as much time to give to it. If inventory has been rightly taken it has developed all the worthless and unsalable goods in the house. It now remains for us to get rid of them, and with many this is a sort of nightmare, while properly handled and displayed it is not a hard job at any time. Give them a table of their own; show them at their best, with a price that will move them, and if that price don't do it give them another. Lump them off to contractors, shop men, factories or what not. Sell them at some price, and you will have done the best job of the month, leaving you in good shape for the 11 months to follow.

THE IRON AGE AS THE NATIONAL WINDOW DISPLAY.

FROM AN AUSTRALIAN CORRESPONDENT.

THAT the series of articles in *The Iron Age* under the heading "Show Window Display" are read with attention in Australasia is a fact that goes without saying. That many of the suggestions and illustrations embodied in the series of articles are frequently adopted out here by the more enterprising of our Hardwaremen is indisputable.

ANOTHER PHASE.

Another characteristic of this window display which *The Iron Age*, or rather its advertising manufacturers, have not yet brought home to Australian merchants, and this statement will be confirmed by your correspondents in many other parts of the earth where the paper circulates, is that *The Iron Age* is taken because it is valuable in their business.

THEY DON'T SUBSCRIBE FOR FUN.

Certainly your subscribers outside of America don't purposelessly subscribe to *The Iron Age*. They would, in preference, put the annual five dollars into, say, Wire Nails, and turn over the amount two or three times in the year. Your subscribers are in business to make money. So are your manufacturers, and at present the two are not closely enough in touch.

THE IRON AGE AS THE NATIONAL WINDOW DISPLAY.

Your manufacturers, or rather those among them who seek an export trade, give no indication of such a desire in their windows—i. e., their announcements in *The Iron Age*. There are numberless Hardwaremen out here with a keen eye after American goods and American novelties to whom America is a sealed book.

THE COMMISSION HOUSES.

Oh, yes, that is a familiar argument, but the commission houses are not too dearly loved. Besides, the advertisement must create interest before even the commission houses can touch the business. The writer knows of more than one small syndicate of buyers in Australia who club together to indent (order) direct and share cost and profit.

YOUR MANUFACTURERS WANT THAT TRADE.

Then let them dress their window to catch it. In other words, when they don't send a traveler to us they should display their advertisements in accordance with what they believe to be the export demand. *The Iron Age* advertising pages are their store window, or opportunity, but they don't display the goods to catch our orders. When they do send a traveler let them dress their window all the same; possibly their traveler can't afford the time to go out of the beaten track, but the "store window," penetrating both large and small places, is a continual reminder 52 times a year; and by all means change the advertisement frequently. These remarks do not apply to those advertisers whose customers are within easy reach by telephone or telegraph. But if trade is sought beyond the seas, let us see some indications of the desire in the show window alluded to above.

We are all, even at this end of the earth, satiated with commonplace, uninteresting statements, that "Broyn's Horse Nails and Smith's Boilers are the cheapest and best, depots in Chicago, New York, &c., &c.," but we want to know why they are cheapest, and how they are best. What would be valuable would be a straightforward, educational statement that does not claim more than is actually so, but, above all, instructive. "Write for catalogue"—we have written for too many.

Can we not have an occasional f.o.b. New York statement, and a short, clear advertisement showing why efficiency is greater, and costs less, with some idea of method of packing, &c., &c.? In short, an announcement that would talk somewhat as a traveler would talk, offering to meet every requirement, even promising a quotation at port of delivery, on application. Nor would this be advance information to competitors. Your advertisers may be perfectly sure their competitor knows pretty well what they are doing. Possibly the commission houses would scream, but your merchants can't afford to be tied to them forever.

EXPORT ORDERS A SPECIALTY.

What harm, for instance, could possibly be done by a couple of lines of type at foot of an advertisement saying, "Export orders a specialty. Prompt shipment guaranteed. We will meet all your market requirements, and work out any local patterns you want. We will specially cater for your market."

"Our representative in Australia is ———."

"Our representative in India is ———."

"Our representative in South Africa is ———."

THE STORE WINDOW SHOULD BE EDUCATIONAL.

Crisp, well written and well chosen words should be used. Illustrations are desirable, but not always necessary. No advertisement is so small that it can be overlooked, and one of the smaller ones in *The Iron Age* (that of the American Sheet Steel Company) is one of the most attention compelling. The Putnam Nail is also businesslike and brisk. These two are not named to deprecate the others, but merely mentioned as noticeable features in the "show window." Some of the Edge Tools advertisements are good, and the Nicholson File window display is always bright and attracts attention. Kitchen Ironmongery is scarcely noticeable; in fact, has to be looked for. Hollow Ware, for instance, seems almost entirely absent, yet little Canada (the term is used advisedly) is getting a steady trade out here while America is not.

This part of the world passes by your window, and not seeing its requirements in some lines goes elsewhere.

Show us all your goods. Then we may suddenly realize that we require them, if you also show the facilities for getting and handling them.

The Hardware Outlook for 1902.

We are indebted to Hardware merchants in all parts of the country for the letters given in the following pages. They refer to the general features of business in 1901 and the outlook for 1902. The reports, covering as they do the entire country, will be of special value to those who desire to be accurately advised as to the conditions prevailing in the various States, inasmuch as our correspondents are representative and responsible Hardware merchants in close touch with their communities.

ALABAMA.

Demand quite up to previous records. Nothing special to hinder or affect business. Stock with us larger than ever before. Collections fair, but require close attention. Conditions favor good business next year. People in fairly prosperous condition. Labor fully employed. High price of foodstuffs will seriously curtail consumption. Developments in building and new enterprises good in 1901, but we think will subside in 1902.

The scarcity of grain and the high price will prevent such large planting of cotton for 1902. Demand for goods about the same as last year. Stocks are about normal. Collections not so good as last year, and many of the advancing merchants will carry over 40 per cent. Cotton at 7½ cents did not keep our people out of debt. They bought more goods on credit this year than ever before. Labor in this section is well employed, as all iron works are running and prospering. Building material in fair demand.

ARIZONA.

Business about same as last year. Very dry season has had a tendency to depress business somewhat and make collections rather slow, but, on the whole, it has been a very fair season. Stocks are not much, if any, larger than average. This is an irrigating country, and is very dry at present. Unless we get rain soon the outlook for next season is not very encouraging. Mining is active, and country generally prosperous now. Labor is well employed. Farmers in fairly good condition, but if drought continues they will not be getting ahead any. Building is fairly active, and town and country are growing steadily.

The demand for Hardware, particularly of the heavier lines, has been the best in the history of Southern Arizona, due chiefly to activity in the mines. Heavier stocks than usual are being carried. Collections good. Present indications for 1902 are good, barring the threatened reduction in the price of Copper. Should a radical cut in the price of this article be made it would stop the development of many mining properties, and consequently seriously affect our business, which is largely dependent upon this industry. The new enterprises, particularly, would be affected.

Business in this section has exceeded all previous years. The mining trade has been steadily growing, and trade in Mining Supplies and Mining Machinery has been especially good. On account of the high prices we endeavor to keep stocks as low as we can. Collections have been very good. The indications are that we will have a larger trade in 1902 than we have had this year.

ARKANSAS.

Trade has been much better in 1901 than 1900. Building has been much better. Our increase of business has been on the following goods: Nails and Builders' Goods, Lime, Cement, Plaster, Locks and Hinges. Collections good. Drought has cut short the crops, but the building of the St. Louis & Northern Arkansas Railroad through Boone County has given labor to many, and the people do not feel the effect of the drought so much. Prospects seem good for 1902.

Our sales are ahead of 1900. In some lines there has

been a decided falling off, in other lines an increase: Nineteen hundred was an exceptionally good year. The cotton crop through this section will be about 60 per cent., and the corn crop almost a total failure. There are a good many of the farmers who are prosperous and always have money. The lumber in-

interest through this section is a big factor in trade and makes business good, notwithstanding bad crops. There are a number of new buildings going up in our town, and we see no reason why we should not have good business for 1902.

The trade of 1901 has not been as good as 1900. However, considering the shortage of crops, which average only about 55 per cent. of normal, trade may be called good up to date. Stocks in the hands of merchants are about as usual, no overstocks, still plenty for all demands. Collections are fairly good. On account of the very short crops the cash trade for next eight or nine months will be limited. The farmers have spent most of their money in paying debts and must depend to a great extent on their credit until they can make another crop. One great help to this section has been the building of a railroad, and also the building of locks on the river by the Government. Both the United States and railroad company have spent a good deal of money for labor and supplies, and this has helped the poor people wonderfully. If it had not been for these disbursements the condition of the poor people would have been sad indeed.

CALIFORNIA.

The season of 1901 opened with flattering prospects. Before summer came we began to realize that the year was to fall below the average in volume of business. This is purely a mining community, and all depends on mines. Two of our large mines have suspended operations, which adds to the depression. Stocks are light. Collections bad. Little labor employed. No farming, no building and no new enterprises. Indications for 1902 not flattering.

Business during the year has been generally good, somewhat affected by strikes. Stocks on hand are about normal; no scarcity. Collections good the entire year. Indications for good business next year. People generally prosperous; nearly all laborers employed at fair wages. Financial condition, all branches, good. Building projected will exceed any previous year.

Trade has been very good this year, especially in Builders' Hardware, but competition has reduced profit so that it hardly pays the clerk hire to get out orders, much less a profit. Collections best in years. We look to 1902 as the best year California ever saw.

COLORADO.

Demand for goods is brisk and fairly continuous. Constant seeking for something new and improved. Competition very severe in all our line, and certainly being carried to the "danger line" in the scramble for volume. Credits are too freely granted and extensions in payment freely asked and almost as freely granted. The effort to gain in volume seems with some to be running the profit per cent. too close for ultimate recovery. Stocks are now fairly heavy. Collections cannot be said to be more than fair, from 33 to 40 per cent. the average outstanding. High prices and feeling on part of consumers that this could not continue was for first nine months of 1901 cause of small buying. Business outlook for 1902 seems to be good. There does not appear to be any surplus of skilled labor. Common labor is fully em-

ployed; very few idle. People appear to have money and to spend it quite freely. Farmers and stockmen are all prosperous, with very little complaint, and that is certainly a comfortable feature to report. Building in this region is more in volume than for nine years past; do not seem able to cope with the requirements, and with this it is satisfactory to state that unimproved real estate prices, while firm, do not "taste" of boom or speculative figures. Considerable enterprise manifested in the mining business and in the beet sugar industry; outside of this very little in a general way of manufacture can be said. Increase in our business for 1901 over 1900 about 30 per cent.

This territory has been filling up and the demand for goods is increasing with every year. The year just passed has seen an enormous demand for building material and such material as is used in the settling and development of a new country. Nails, Barb Wire, Corrugated Iron, &c., have been active all year, and promise to continue in increasing demand for 1902. Stocks are lighter toward the end of the year, but large orders have been placed for 1902 delivery and stocks will all be full by March. The merchants here are carrying larger stocks than ever before and they are making greater efforts to increase business than ever. Trade prospects for 1902 in general Hardware are very good. Never have things looked brighter in this territory. Labor is employed and at good wages. Farmers have good crops and good prices, and money is plenty. Collections are good. The building boom which we have enjoyed in 1901 bids fair to be eclipsed in 1902. Rents are high and in many instances houses have been rented long before they were completed.

CONNECTICUT.

General business for 1901 has been about the same as for 1900. An unfavorable factor locally has been the uncertainty in regard to factories controlled by trusts. Sudden changes in regard to management have caused the discharge of many employees. Stocks of merchandise are usually light. Collections fair to good. Indications seem to point to a good working business for 1902. Building has been somewhat overdone and there have been a number of failures among irresponsible builders. In fact, for some years a large part of the building has been done by men without capital at prices which a responsible builder would not meet. Losses have been so numerous that lumber and Hardware dealers are beginning to refuse credit and figuring to get better profits. Builders' Hardware should pay a profit of 25 per cent. to be worth handling. The principal factories about here are well filled with work. Farmers in this vicinity depend largely on tobacco as a money crop. This fall the weather has been so dry as to prevent packing and they have been delayed in marketing it, but recently conditions have been more favorable.

The demand for Hardware for the last year has been hardly up to the average. We have had for two years carpenters' strikes and for one year a machinists' strike, and in addition to this, right in what should have been the best portion of the spring we had excessive rains, which were a great hindrance to the trade in general. Stocks are about medium. Collections have improved considerably during the year. People are generally prosperous; labor is very generally employed at the present time. Farmers in our immediate vicinity have not had a good year. The excessive rains almost destroyed many of their crops. The apple crop was a total failure, also the potato crop. The amount of building at the present time, owing to the strikes of the spring, is light. Think the outlook for the coming year is a good deal better than for the past one.

Trade was lighter than usual, but has been very good since September 1. Stocks generally heavy. Collections generally good. Farmers generally doing well, spending money more freely than for two or three years. Building has been very dull since '98, but is better now.

My business for 1901 was a little larger than the average year. Stocks are light. Collections good. A good tobacco crop this year. The financial condition of the farmers is better than for 1899 and 1900.

Our business for the year 1901 has been very satisfactory and our books will show an increase of sales of 25 per cent. over last year's business. We have been handicapped to a certain extent in getting goods, especially Builders' and Heavy Hardware, and as yet we fail to see any signs of relief from the present condition.

Demand larger than in 1900. The fact that labor has been so generally employed has made the volume of business more uniform and larger. One drawback we notice especially is the tendency of consumers to ask credit, requiring a larger capital to do the same amount of business on. Stocks are low. Collections only fair; not as good the last six months as the first. Building prospects are light in this section. Labor at the present time is well employed. Farmers in this section have not gained in financial strength. Trades unions have discouraged building in this locality.

Owing to what might be considered high prices the tendency has been to purchase for immediate demands. For some reasons building among certain classes has been checked, but now quite an active movement. Farmers, owing to high prices in grain, have lessened their production, but the increase in price has advanced in proportion and I think they make a mistake in not producing to their full capacity. Stocks are comparatively light. Collections, while not considered bad, are slow. Very few are unemployed and the prospect for the future is good.

DELAWARE.

Our business is much better than in 1900. Our local business is affected by the nearby cities, as we are compelled to bid against them in the smallest amounts. To hold our trade we are compelled to increase our stock each year. Collections never were better. Our farmers are prosperous; the outlook is good. Labor is all employed. Building has been good, especially during the latter part of the year.

As well known, the demands of trade are always changing. Our business has increased 20 to 25 per cent. over 1900, partially attributable to the good prices obtained for farm products, fruit and grain, yet the farmers have had many drawbacks. However, I think they are out of debt and prospering. The high price of corn has helped us amazingly. Our stocks are a little heavier and collections are better than 12 months ago. I take our conditions to be prosperous. There is more building. Labor for the field is scarce and is driving some farmers off the field.

Demand about the same as 1900. Stock fuller than usual. Farmers had good crops, but collections slow. Hindrances which have affected trade are the combine on Shovels, Scythes and other goods, catalogue house competition and jobbers selling to consumers. People are fairly prosperous; all who want employment can get it. Many improvements in building; in fact, the Building Hardware trade has been unusually good in our section. Are building better and more modern houses.

DISTRICT OF COLUMBIA.

Our business this year has been larger than ever before, though the increase has not been quite as great as in 1900, owing to the decline in our sales to the War and Navy departments, naturally due to the closing of the war with Spain. We have no special hindrances to trade to report. The competition in this city is hard, but we are bothered very little with competition outside of it. We should say that stocks are heavier than usual. Collections are good and our loss account this year will be

The Hardware Outlook for 1902.

We are indebted to Hardware merchants in all parts of the country for the letters given in the following pages. They refer to the general features of business in 1901 and the outlook for 1902. The reports, covering as they do the entire country, will be of special value to those who desire to be accurately advised as to the conditions prevailing in the various States, inasmuch as our correspondents are representative and responsible Hardware merchants in close touch with their communities.

ALABAMA.

Demand quite up to previous records. Nothing special to hinder or affect business. Stock with us larger than ever before. Collections fair, but require close attention. Conditions favor good business next year. People in fairly prosperous condition. Labor fully employed. High price of foodstuffs will seriously curtail consumption. Developments in building and new enterprises good in 1901, but we think will subside in 1902.

The scarcity of grain and the high price will prevent such large planting of cotton for 1902. Demand for goods about the same as last year. Stocks are about normal. Collections not so good as last year, and many of the advancing merchants will carry over 40 per cent. Cotton at 7½ cents did not keep our people out of debt. They bought more goods on credit this year than ever before. Labor in this section is well employed, as all iron works are running and prospering. Building material in fair demand.

ARIZONA.

Business about same as last year. Very dry season has had a tendency to depress business somewhat and make collections rather slow, but, on the whole, it has been a very fair season. Stocks are not much, if any, larger than average. This is an irrigating country, and is very dry at present. Unless we get rain soon the outlook for next season is not very encouraging. Mining is active, and country generally prosperous now. Labor is well employed. Farmers in fairly good condition, but if drought continues they will not be getting ahead any. Building is fairly active, and town and country are growing steadily.

The demand for Hardware, particularly of the heavier lines, has been the best in the history of Southern Arizona, due chiefly to activity in the mines. Heavier stocks than usual are being carried. Collections good. Present indications for 1902 are good, barring the threatened reduction in the price of Copper. Should a radical cut in the price of this article be made it would stop the development of many mining properties, and consequently seriously affect our business, which is largely dependent upon this industry. The new enterprises, particularly, would be affected.

Business in this section has exceeded all previous years. The mining trade has been steadily growing, and trade in Mining Supplies and Mining Machinery has been especially good. On account of the high prices we endeavor to keep stocks as low as we can. Collections have been very good. The indications are that we will have a larger trade in 1902 than we have had this year.

ARKANSAS.

Trade has been much better in 1901 than 1900. Building has been much better. Our increase of business has been on the following goods: Nails and Builders' Goods, Lime, Cement, Plaster, Locks and Hinges. Collections good. Drought has cut short the crops, but the building of the St. Louis & Northern Arkansas Railroad through Boone County has given labor to many, and the people do not feel the effect of the drought so much. Prospects seem good for 1902.

Our sales are ahead of 1900. In some lines there has

been a decided falling off, in other lines an increase: Nineteen hundred was an exceptionally good year. The cotton crop through this section will be about 60 per cent., and the corn crop almost a total failure. There are a good many of the farmers who are prosperous and always have money. The lumber in-

interest through this section is a big factor in trade and makes business good, notwithstanding bad crops. There are a number of new buildings going up in our town, and we see no reason why we should not have good business for 1902.

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The Outlook for Hardware

less than usual. We are looking for a largely increased business in 1902. This city is largely dependent upon the salaries of the Government clerks, which increase steadily from year to year. There are very few unemployed mechanics, and we expect their wages will be higher. There is a large amount of building projected for 1902 in apartment houses, office buildings and residences.

Trade during the year just closing has been exceedingly brisk. In volume about 20 per cent. ahead of 1900. This condition can be largely attributed to the general prosperity with which our section has been favored, and the only drawback in our experience has been our inability, in a great many cases, to have our orders filled for such articles as Sheet Iron, Tin Plate, &c., during the strike. Our stock on hand is about as usual at this season of the year, only we are endeavoring to reduce the same in order to facilitate the taking of inventory. Indications for business in the spring of 1902 seem to be good, as architects and builders are busy estimating on propositions for building operations.

GEORGIA.

The demand in general lines was as good or a little better than usual up to August 1. At that time there was a considerable falling off and it has been light during the last four months. The light fall business is probably due to short cotton crop and also to the fact that it has cost more to make the crop than it usually does. Stocks in dealers' hands are unusually heavy, as a heavy fall business was anticipated but failed to materialize. Collections are below the average. The people in this section seem to be in a fairly prosperous condition, but large numbers of farmers and some smaller merchants are asking for extensions on past due indebtedness. We look for more conservative buying on the part of merchants and farmers in 1902.

Much less demand than for 1899 and 1900. Bad condition of Turpentine business, which is our specialty, and a short crop of cotton, with low prices to date. Our stock heavy and collections bad, though after careful sales and collections for past six months our present condition is easy and satisfactory. Turpentine conditions we think favorable for 1902. We think business men are carefully liquidating. Labor all employed and demand for more, especially in Turpentine and mill business. Farmers in fairly good financial condition. Quite a lot of new building going on.

Trade for 1901 up to August 1 was exceptionally good. Since that time it has been exceptionally poor, due in a large measure to a short cotton crop. Stock is heavier now than ever before. Collections are considerably behind last year. Prospects for 1902 are not very encouraging. The farmer is the backbone of the country, and he, as a rule, is in financial straits. The indications are that very little building will be done next year.

Indications for 1902 are as good as any year that we have had in this section. January, 1902, trade will be the best January this section has ever enjoyed.

ILLINOIS.

Good demand. The drought injured business somewhat. Stocks generally good. Collections good. Everything points to a good business in 1902. Our laborers can all find employment. Farmers generally will get more money for 1901 crop than they have for some time. Prospects for building good.

Our trade for 1901 was the largest in our history by far. All Hardware dealers in this city report increased sales. Good times and plenty of money seems to be the cause. Our stock is larger than ever and collections have been good. The people in this vicinity are pros-

perous. More money in the local banks than ever before by 33 1-3 per cent. Labor is all employed at good wages. Farmers are in good condition as they are getting high prices for all of their product and the crop was fair. Prospect for building for 1902 is very promising, and we look for even better trade than this year.

About the same demand as 1900. There has not been as much building as in other years. Stocks are heavy and collections good. People are prosperous, labor all employed and hands scarce.

Nineteen hundred and one has been the largest in our history. We account for this from the fact that mechanics are all busy, and at good wages. With fair crops and big prices there never has been a time when the product of an acre of land would buy as much merchandise. Our stock is fair, but rather light than heavy. Collections fully as good as usual. We look for 1902 to be the banner year. Take all classes of the people and, as a whole, they never were as prosperous as now. Everybody has work. Farmers all feel rich. The outlook for building better than at this time last year.

We have enjoyed the largest trade the past year of any since 1892. A great deal of farm property has changed hands and a great many improvements made on these lands. Lack of rain cut into trade to some extent. Stocks are light. Collections were good up to December 1; now slow. We depend largely on trade of the farmers. They are, all things considered, in good shape. We look for a good trade for '02. Labor well employed. We think there will be a large business in building material.

Our stock is larger than ever before. Catalogue houses disturb prices and everybody that has any commercial standing is solicited by some jobbing houses. People are prosperous and labor fully employed. Farmers have more money than ever before. Prospects for building are good.

INDIANA.

We have had less demand in Hardware than last year, especially on all goods of an abnormal high price, such as Nails, Wire, Shovels, Scythes, Garden Tools, &c. We feel the effects of the so-called department stores, really big dry goods firms, 5 and 10 cent stores and cheap John stores offering with other goods Hardware at and sometimes less than we can buy it for, also wholesale houses catering to the retail trade for all there is in it. Our stocks are light but well assorted. Our rates are nearly all cash, and therefore cannot say how collections are. Prosperity in our vicinity is not what it is in general. Labor nearly all employed, but at small wages. Condition of farmers is good.

The demand has been good except in Builders' Hardware. Farming Implement trade excellent, but building seems to have been very quiet up to August 15, when it picked up. Stocks now are light here owing to drought having cut corn crop to one-third of its usual yield. We think trade will be quiet, and more than the usual amount will be on credit for the coming year. Collections were good from the oats crop, but corn crop collections are exceedingly slow. This is partly caused by a rising market. The people in this vicinity are very prosperous. There does not seem to be any especial spread in building.

An unprecedented demand for goods. Trade hindered on account of not being able to get goods promptly. Stocks light. Collections fairly good. The people generally prosperous. Labor well employed. Condition of farmers best in years. Indications for extensive residence building.

Business the largest in our history. Ours is an agricultural community, and our farmers are enjoying great prosperity. They are buying more freely and paying

more promptly than ever before. Collections have been fair, considering the shortage of the corn crop. We are carrying over pretty heavy stocks. We have found the demand to be for the better class of goods. Community generally prosperous. Labor fully employed. Farmers in fine financial condition, and there will be another year of improvements and building among the farmers.

First half better than 1900, latter half less. Good wheat crop influenced good trade. Early in year failure in corn crop damaged business since harvest. Stocks are about the average. Collections are poor. People have been prosperous for two years past. All labor was employed. Farmers' finances in good condition.

Our trade for 1901 has been very satisfactory. Collections are slow, on account of short crops. Our stock is up to the average. We expect a fair trade the coming year.

IOWA.

Business in our territory has been better than any previous year. Money is easy, and farmers are doing considerable improving and necessarily using more Hardware. The impression prevails, however, that this is the "oasis" of the West, and goods are sold very freely at very small margins, and hence we do not believe profits will show up in accordance with increased sales. Stocks are a little larger than usual. Collections are just fair. Increased prosperity with the farmers only makes them slower pay. However, the risks are very small, and they know it. Laboring classes are all well employed at good wages, and people generally are very prosperous. Farmers especially are doing well. Prices of their produce are very good, and having had fair crops they are especially prosperous, and are building and improving their farms, making business in small country towns good during past season, and indications are favorable for next year. Our city trade, though good, is not what we should have.

About 25 per cent. ahead on sales of previous ten years, good prices for farm products and wonderful advance in farming lands. Stocks very light. Collections the best in years, and every note paid. Never in my business experience of 26 years but what I had to carry over unpaid notes, &c. Farmers have money to burn. Any and everybody can get work that wants to work. The future outlook is excellent.

Demand has been very good. In our immediate locality crops are very short on account of no rain. Stocks, we think, are very light, owing to high price of goods. Collections are good. Indications point to good business in 1902. People very prosperous. Labor is very hard to get in all lines. Common laborers get from \$1.50 to \$1.75 per day. Farmers are in fine shape financially. Large amount of building in sight for 1902.

Trade generally has been fair. The demand for Builders' Hardware rather above the average. Profits have been kept at a low per cent., owing principally to local competition and the sending away to large department stores for certain supplies. The large department stores will continually monopolize a good share of the legitimate retail trade unless something is done by the manufacturers to head them off. Every laborer has full employment at good wages, and it is almost impossible to procure common labor without engaging ahead. Financial condition of farmers first class, never better. Building prospects for next year good.

KANSAS.

The demand is better than in other years. Fall trade suffered from the short corn crop. Our stock is generally very complete and as large as usual. Collections are good. The prosperity of the people is above the average condition. Labor is fairly well employed, even at this time of the year, which is hardly usual. Farmers' condition is generally fair.

Good business until August 1, when owing to drought

trade fell off. Stocks and collections fair. People in fairly good condition, but trade will be smaller for the first half of 1902. Don't look for much new building until last half of 1902.

The demand has been in excess of other years with us, and it seems the same in the territory about us. The special influences were good crops and energetic farming. We see no hindrances to trade; nearly all our farmers are out of debt. We should think stocks are full, but not overloaded. Collections have been good. Our people are making healthy improvements, as a rule, and are getting in shape to take care of their implements. All our people are employed, as a rule. We are bothered sometimes for want of hands, but bear it in preference to importing help.

General demand larger than in other years. The influences that have affected business most are prices of farm products and unusual prosperity of the people. The greatest hindrance to trade is the difficulty of getting orders filled by jobbers or manufacturers and the inability of railroads to make prompt delivery of shipments. People are more prosperous than ever before. All labor is employed at good wages. Farmers are paying cash for 80 per cent. of their purchases. Towns and country are building better and more substantially than ever before.

The demand has been larger than ever before for all kinds of goods. The strong influence has been our large wheat crop. Indications for business for the coming year are good. All classes of people are prosperous. The farmers have a large amount of money in the bank.

KENTUCKY.

The demand in most lines has been better than for several previous years, and our sales show a marked increase. Stocks are pretty full. Collections are good. Trade in this section depends largely upon the farmer, this being an agricultural district. With the exception of a light corn crop this has been a prosperous year with him, and the outlook for 1902 is promising.

We have had a good business. The drought in this part of Kentucky affected trade in early part of fall, but it is now better. Stocks light. Collections fairly good. Outlook is good. We look for quite a building boom among our people in 1902.

The demand is about as last year. The cotton and corn sections have met with serious shortage in these two crops and this has curtailed our sales to some extent. The greatest hindrance to trade is the inexperienced traveling men sent out by so many firms and given unlimited power in making prices. They keep trade in a fret and profits are slaughtered. Stocks are well kept up and collections are very fair. Labor is well employed, and even in the face of bad crops our farmers are in good financial condition, and are not spending their money as freely as in 1900 and 1901, realizing they will have to buy corn at a very high price with which to raise their coming crop. We look for \$1 corn before May 1. In our city buildings are going up all around, and the spring will witness some very substantial improvements here.

LOUISIANA.

First six months largest demand on record, general falling off since. Short cotton crops, coupled with decline in price the cause. Stocks generally full, and collections better with us than is general, on account of our net cash terms. We anticipate a good spring trade. Farmers in very good shape. Good profit in raising cotton at present prices, notwithstanding decline since last year. Labor is very scarce; big demand for farm hands and mechanics generally employed, though demand not so great as a year ago.

Our business has been about 20 per cent. heavier than last year. We have been able to keep our stock in fairly

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good shape, although on some lines we have had a good deal of trouble getting shipments from factory. Collections have been unusually good. We believe the people are in a fairly prosperous condition. Demands for labor greater than the supply. Condition of the farmers seems to be very good. There has been a considerable amount of building and improvement in our city and the surrounding country.

Demand better than in 1900. Rice crop heavy, at good prices. Oil prospects fine. Collections good. Never saw as much money in this country. Cannot hire a mechanic. The largest amount of building in view ever known.

MAINE.

The demand as compared with other years has been very favorable, caused in part by the general prosperity of our country, and from the fact that we have carried an exceedingly large stock. The one thing that has affected this has been the strike situation. This has also hindered trade to a large extent and made customers very anxious for goods, many of which have been advanced to fictitious prices on account of the strikes, as before mentioned, notably Iron Pipe and Sheet Metal. Stocks, as a rule, we consider light. Collections have been fairly good. The indications for 1902 we sum up as follows: Certain classes of goods have been governed in their selling price by trusts and will no doubt weaken; in fact, they have already, and we look for a great deal of this competition during this coming season. The prosperity of the northeastern part of the State is something unprecedented, owing to their very large crops and extremely high prices. Labor has not enjoyed better prices for a great many years. We consider the financial condition of the farmers better than for a long period. New buildings and new enterprises have not taken on the proportions that this State has been noted for in the past few years. Still there has been a healthy business all around, and the conditions of trade, in our opinion, are much better than they have been for a long time.

Demand for goods has been very good; about the same as in 1900. Stormy weather affected business very much in the early spring, and the big freshet this month has helped very much to retard moving of goods both in and out. Hindrances to trade are too much competition, too many drummers after one customer. Our stock, in most lines, is light. Collections are good. The people, as a class, are fairly prosperous, although it costs 25 per cent. more for necessities of living, to say nothing of luxuries. Laborers that want employment find no trouble in getting it at advanced prices. Farmers should be, and undoubtedly are, in good financial condition. Have raised fine crops, and prices for some are way up. Much in the way of new building.

The demand for goods has been better than 1900. Competition has been sharp and profits small. The extreme fluctuations in Linseed Oil seriously affected the Paint trade. Stocks are heavier than usual at this season, and collections are extremely slow. Very few failures. A better and more confident feeling is abroad. Our farmers are in a prosperous condition, having received good prices for farm products, which are above the average in quantity, quality and price. New buildings are to be built, but much will be done for repairs.

Owing to local conditions our own business about same as last year. General business in this section better. Average stocks at present. Collections have been very good. We look for considerable building during 1902.

MASSACHUSETTS.

Demand has been below the average, caused by high prices and hand to mouth buying, light fruit crop and potato crop. Total value of sales will about reach the

average. Spring business has been restricted, because of late deliveries, notably in Barbed and Woven Fence Wire and Wire Nails. Stocks are lighter than usual. General stores are buying very conservatively, but collections good. People on the whole are prosperous. Labor is well employed in shops. Financial condition of the farmers this fall is below the average, because of light money crops. Building very light and no new enterprises in this section. If snow this season gives farmers a chance to market their wood and lumber to the best advantage their condition should be fully up to the average next spring.

The high prices of Hardware and in fact all building material in 1900 prevented contracts being made for this year. In other than Builders' Hardware we have had a good trade and perhaps fully as profitable. Like all who are near the large cities, we have the department stores to contend with, and on our most profitable lines. If they would only tackle Nails and a few similar articles! Collections on the whole have been fully as good as in previous years. As a rule the people are prosperous. Very few unemployed persons are in this section. Farming hands have been hard to obtain the past season. The heavy rise in grain will be hard on many who raise little, and undoubtedly will, in a great measure, have to be paid by consumers of milk and butter. I do not anticipate much building in this immediate vicinity next year.

Trade has been quiet. We are overbuilt and are now feeling the reaction. Our stock of Hardware is very low. We soon will be obliged to purchase several cars of Nails. Think it about time to put them in. Collections are rather hard, but perhaps no worse than usual. Labor is fairly prosperous and well employed. The farmers have done well the last year and are prosperous.

Better trade than last year. Formation of trusts has made profits smaller. Shipments from manufacturers have been slow. We consider stocks medium. Collections are fair. Next year looks bright. All manufacturers are rushed; good laborers are hard to find. There is a large amount of building in view for 1902.

Demand about the same as other years. No special influence on trade. Stocks light on some lines of goods and other lines about as usual, and some lines heavy; on the whole a little lighter than usual. Collections best for years. Quite general prosperity among the laboring classes, but the farmers feel poor. Crops in this vicinity have been such that the farmers will realize very little money. Labor is well employed and outlook for next year is bright.

MARYLAND.

Our business this year has been the heaviest we have ever had. This applies on all the items in our line of business, and caused, we think, by our farmers being in better financial condition than for many years. The extra good wheat crop last year in our section influenced an unusual amount of trading for the first six months of the year, and the extra good corn crop has been the means of our trade holding up to the standard for the last six months of this year. Our collections have been very good from last August up to the present time. Our present stock of goods on hand is a little above the average. The prosperity of the people here is, we think, up to the average for a small town like ours. We have several manufacturing industries here which are running on full time and giving employment to quite a number of employees. The financial ability of the farmers is good. The amount of building the past year hardly as much as last year. There are no new enterprises in contemplation.

The demand in general was rather above the average in most staple lines. While we are not through stock taking we are satisfied that the year now closing will show a very satisfactory gain. Collections more than fair. Condition of our people is good, with labor all

employed. The farmer is in elegant shape, with good crops and prices above the average. Prospect for building good.

Our business entirely satisfactory. Volume of business very much increased over last year. Collections fairly good. We start the year with a new addition to our building, which gives us one-third more space, and this, coupled with the fact that good business is now going everywhere, labor employed generally at good wages, make us feel confident that 1902 will close with a handsome increase over year just ending.

MICHIGAN.

We did the largest business in 1901 we ever did, excepting in 1891 to 1893, the excess then being due to large sales of Bicycles, which counted up fast at the then price. We notice special increase in all Mechanics' Tools and Shop Supplies. Prosperity brings larger demand for Household Goods and of better quality. Merchants are not anxiously and uneasily trying to force a demand for their goods at the expense of prices. The scarcity of goods in certain lines helps the fairness of the market, and is not an unfortunate feature in our business. Stocks with us are as full as ever they were at this time and fuller. Collections good. We have also a good stock of faith in business for 1902, and shall not hold back purchases for fear of a drop.

This year has been an exceptional one for the sale of all kinds of merchandise. The volume of trade for Hardware has far exceeded any previous year since the 60's, the spirit of thrift has been largely manifest among farmers, for the reason of good crops and high prices for all their products excepting wheat, and as they are not raising the old time stocks of wheat they do not receive an income from that source. Collections are good, and much money comes from cash sales, or "cash on the nail." I have but very little complaint from producers. Farmers, as a rule, seem satisfied. Labor has a fair price, and is fairly well paid. We shall have to build from 100 to 200 new houses next year. This will be a great send off for our already fine town.

Demand far ahead of 1901. Labor employed at good wages. Good prices for farm produce. Collections fair. People never more prosperous. All can get work, not enough help. Very good prospects for the future. We have had a steady trade, gaining each month over corresponding month of last year. We have never sold a larger volume of goods in any past year. Our furnace, plumbing and tin shops could not keep up with orders.

This year's business best in our experience. People feel in the right frame of mind to buy goods. Work is plenty at good wages, and help hard to get in all lines. Farmers have had good crops, and are getting the best prices they have in years for them, and are paying their debts off, and improving their property. Farms around here are selling from 33 1-3 to 50 per cent. higher than they were four or five years ago. Collections are good. We think there is every prospect of a good business next year, especially in building material. We are carrying our usual stock, except in Nails and Glass and a few other articles, which we are buying as we need, on account of price being higher than we think it will be later.

Trade with us has been this year better than any year in our experience. More building done than for years. We are looking forward to a good year in 1902. Labor is all employed at good wages, and everything points to a prosperous year. The prospects are now that there will be a large amount of building.

MINNESOTA.

Demand has been active. Sales have increased. Improvements in city and farm buildings have been large. Much less disposition to complain of prices or strive for reductions. The call for better grades of goods is very noticeable. Locally, conditions unfavor-

ably affected by new competition in excess of natural trade increase. Stocks are well maintained in quantity, but without speculative purchases or holdings. Collections rather above the average. Prosperity in general. Farmers are receiving good prices for most everything, and the highest in 30 years for butter, eggs, poultry, &c. Oats and corn are exceptionally high. Farm land has rapidly risen in price and is in active demand at steadily increasing valuation. All are actively employed at fair wages except the constitutionally lazy. Prospects for 1902 are excellent. Farmers are in good shape. Much building and many improvements contemplated, presaging a heavy year.

Trade the past year compares favorably with former years, showing some increase, which, although not considerable, is healthy. Demand has been about same as heretofore with an inclination for better and newer goods. So-called catalogue houses and city department stores have, of course, had an influence more or less detrimental to the business of legitimate dealers. Our stock changes very little from year to year and is equally as heavy now as any time. Collections have been good since harvest. Uncertainty as to extent of crops proved something of a hindrance to trade during early summer months, but a fair crop was harvested and people are generally in prosperous condition. Much building is in progress and labor is employed to the limit. Farmers and laborers are in healthy financial condition, and in our judgment prospects for the coming year are indeed encouraging.

Trade has been good with us; we have sold 10 per cent. more goods than we did last year and at a better profit. The dairy is the cause of our increase and the cow will be a great factor in the increase of trade with us for the next five years. Stocks are about 80 per cent. as compared with 1900, and collections are 20 per cent. better than 1900. Our farmers have begun to make money with the change from wheat to mixed farming, the dairy interests of Central Minnesota are growing and all realize that it means prosperity in the town as well as country. The building outlook is good for 1902.

The demand for goods has been heavier this year than any previous year since 1892. Were very much handicapped in not obtaining the necessary supply of Fence Wire, Field Fencing and Poultry Netting for spring trade. This fall we were slow in getting sufficient supply of Sheet Steel and goods made of this material. One bad feature is that jobbers and manufacturers willfully mislead us when they are able to supply goods, putting us in a position that throws distrust on us from our customers. I am looking for a still better trade, at least for the first half of 1902, from the fact that our farmers had good crops and are getting fair prices and therefore are ready to improve their buildings and fences. Our laboring people are well employed at fair wages and will continue to be for at least the next six months.

MISSISSIPPI.

Demand not so good as last year. Two bad crops and bad weather have hindered trade. Stocks about same. Collections bad. The people, especially farming community, in bad condition. No corn and many in debt. More labor than wanted on account of nothing to supply them with. Financial condition of farmers not so good as previous years. Not much building and not many new enterprises.

MISSOURI.

Although some goods (especially Barb Wire and Nails) are cheaper, our sales for 1901 will exceed last year's sales by 7 or 8 per cent. The extreme heat during summer was surely a drawback. Stocks generally nearly full. We sell for cash. Most people are prospering. There is work (with good pay) for all who want to work. Financial condition of farmers is good. There is talk of building a few more packing houses at the stock yards and a second bridge across the Missouri River. Several large

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buildings for wholesale houses are now in course of erection.

Business about the same as 1900. Loss of corn crop and spring drought have hindered trade. Stocks are light. Collections are good. Prosperity of people generally good. Labor all employed.

MONTANA.

Demand has been equal to the last two years, and better than for several years previous. Stocks are rather light. Collections have been good. People are prosperous. Labor is well employed at good wages. Financial condition of farmers is fair. Many new buildings will be erected in 1902, if those who intend to build carry out their intentions.

Business better than in previous years. Collections also better. Stocks about the same. The outlook for 1902 is good. The coal industry (which is the staple industry here) is prospering. The farmers are in better shape than ever before. Building going on in good shape.

NEBRASKA.

Business during first nine months of the year showed a small increase over last year; last three months show a decrease. Volume of business will about equal last year for the whole year through. Shortage of crops caused the decrease in latter part of season, helped somewhat by the shrinkage in the price of grass cattle. Stocks, as a rule, are not above the average. Except in some instances, merchants have not had the sale on stoves that they expected. Collections have been good, considering the shortage of crops and the decrease in prices of cattle. Grains of all kinds are higher in price, but none to sell. Everything is needed for feeding purposes. Business in 1902 is not expected to be heavy during the first half of the year. The last half will depend on crop conditions. Farm labor is well employed at fair wages. Financial condition of farmers is good. While they have no great amount of ready cash on hand, they are not owing money, either to banks or merchants. Building has been about on an average with the past three years.

NEW HAMPSHIRE.

Business has been better the past year, a healthy ratio of increase, general prosperity influencing the increase. A fictitious value on a few lines, such as Scythes, in combination with a dry season, made a marked hindrance to sales of Haying Tools and Implements. Stocks are not light. Collections have been good. Looks like good business next year. It is a good deal to have it "in the air" that people are prosperous. Labor is well employed in this section. Farmers feel the high prices for grain and are selling stock to avoid feeding; hence shortage in dairy products, and higher prices to the consumer and no advantage to producer. Fair amount of building going on.

The year 1901 has been above the average for amount of goods sold. Too high prices, as in the case of Scythes, Shovels, Window Glass and some other articles, have tended to make orders in these particular lines small during the year now closing. In the matter of the first named of the above articles, Scythes, there are now almost none at all in the hands of either jobbers or retailers, and liberal orders have been or will be placed for next season without insisting upon knowing just why the price is now less than half that of the past two seasons. The indications are for another good year's business in this section. The sales of Barb Wire and perhaps Nails will probably be larger than last year. A good trade is expected in Agricultural Implements. Collections are, on the whole, fair, in comparison with other years. Past experience goes to show that customers in the small country towns are apt to be slow.

Nineteen hundred and one trade has been good. Our mills have been running at their fullest capacity. Stocks are reasonably full. Collections good. Have been troubled to get prompt shipments. The prosperity of the people is good. Labor well employed. Farmers are in good financial condition. The indications are that there will not be as much new building, &c., in our town as some previous years, but more in some of the adjoining towns.

The main business of this town is manufacturing shoes and business has been better during 1901 than for a number of years previous, and indications point to a better business in 1902. Stocks of goods are rather below the average. Farmers are in good shape, although the high price of feed stuff, of which they buy a great deal, makes it a little hard for them.

NEW JERSEY.

The demand for goods this year compares very favorably with last. The farmers have received good prices for their products. There are two great hindrances to our trade—viz., Granges and catalogue houses; it is surprising the amount of goods coming to our town for and from these parties. Our stock is fully as large as last year at this time. Collections are very slow; the one redeeming feature of our trade is the disposition of our customers to pay cash. Fully 75 per cent. of our sales for two months have been cash. The people of our county seem to enjoy a full measure of prosperity, very little fault finding except with taxes. There has never been a year when labor has been so generally employed. It has been impossible to get help of any kind. Our mechanics have all been rushed. From what we can see the farmers are in better financial condition than for a long time. Very little new building, but any amount of repairing, one farmer starting another. A year or two more like this will make a big change for the better.

Demand probably 10 per cent. greater than in 1900. Trusts have hindered business, in that they take advantage of enormous profits every chance they get. Customers resent it and buy only what they are forced to. Stock somewhat lighter than usual. Many of our customers are behind in paying. Do not consider we have lost much, but many are giving too long credit. Prosperity never greater. All of us are working under much smaller profits, considering our plants and expense, than we were years ago. Labor, perhaps, as fully employed as it will ever be. Many factories are increasing their plants, and many new buildings going up.

The first half of the year very good; the second half, owing to poor summer boarding season, not so good. We look for only a moderate business for 1902. In this community there are a great many people idle at the present time. Do not look for many new building projects.

NEW MEXICO.

Nineteen hundred and one has been much better than the years preceding it. The demand has been brisk. The inability to get goods on account of the steel strike caused more or less annoyance. Crops were good, but the price of wool did not reach the top notch, as in former years. Stocks are only medium, as the merchants have not yet gotten back, the confidence they had prior to the panic. Collections have been good, as they are very carefully looked after. Building has been better than for many years past, and of a more substantial nature than formerly. Uncle Sam has also done his share in these parts for his wards, the Indian boys and girls. The outlook for 1902 is very bright, as we are having a new railroad boom. My customers are buying a better grade of goods than formerly, and \$10 bills are the circulating medium nowadays. It is easier to sell a \$50 Range or an Ames Shovel now, than it used to be in trying to sell a \$15 cook Stove or a 75-cent Shovel. The people are prosperous. Mining interests are looking up, prospectors were

never more numerous. Labor is in demand, and at a premium; \$4 a day for nine hours is paid to skilled labor.

Business for the present year has been the best I have experienced for the past ten years, and things would have been much better but for a strike among the coal miners here. However, that trouble is now settled, and the mines are working night and day, and still they cannot keep up with the increasing demand for our coal. There are now 1500 miners employed, and more new ones coming in every day. We look for an increased business in 1902. The stocks carried in this town are much heavier than formerly, and the prospects for future business are very encouraging. We have no farming interests in this section of the country, nothing but coal mining, wool raising and Indian (Navajo) trade.

Business with us, and we think with all other merchants in our section, has been above the average for the past ten months. Wool is bringing a good figure, and also nearly everything else we raise here, and there is a ready market for same. Our farmers and ranchers seem to be in good spirit, and all seem to have money ready as their needs demand. As far as we can see and judge the coming year will be a very prosperous one in New Mexico, as there have already been a good many rich mines opened up and Eastern capital is being invested rapidly.

Business for the year just closing has not been as good as the year previous. This falling off is due, in a great measure, to the drought and failure of crops, causing a stoppage almost in the shipment of cattle, which has been lighter than for several years. The cattle industry is one of the principal resources of this county. There is apparently not much decrease in the stock of goods, which indicates a fair trade. Collections compare very favorably with other years. The indications point to a heavy demand for cattle during the coming year, and as the cattle men are prosperous good prices may be expected, as they will not be compelled to sell at a sacrifice. Mining, which is the main industry of this county, has a bright outlook, and unless the Copper market is completely demoralized, it will be the greatest in the history of the county. Recent operations indicate that immense wealth is stored in the mines of this county, and with proper development this vast treasure would soon find its way into the channels of trade.

NEW YORK.

With us the demand for Hardware has been fully 30 per cent. less than in 1900, due largely to local conditions, such as the proximity of the Pan-American Exposition, heavy shortage of wheat and apple crops. Contract work in heating, plumbing and tin work has been unusually good, and more than offsets the falling off in the demand for Hardware, so that 1901 has surpassed 1900 both in percentage of profits and volume of business. Stocks are about 75 per cent. of what they were at this period in 1900. Collections fair. Generally speaking, the people were never more prosperous. Farmers have not had as much ready money this fall as in 1900, but have been very cautious about assuming obligations and probably owe less than in many years. Labor is well employed, but present cost of living leaves little above actual expenses.

Never had a better trade. New buildings have increased our trade more than any other cause. Stock is light. Collections about average. Labor well employed, but farmers have little money.

We have had a very satisfactory trade, but think the Pan-American took a great deal of money from our town that should be in circulation here. Our stock is up to former years. Collections are a little slow. Do not know of any reason why we should not have a good business next year. Ours is a farming town, and the farmers are getting high prices where they have the produce to sell.

Sales better than last year. Everybody had work, and

farmers had a good year. Stocks are well assorted, and about medium size. Collections good. Aside from hop growers farmers are stronger financially than in years. People generally are more prosperous than in years.

Demand has been very good, perhaps better than any previous year, owing to the more general employment of labor. Stock is heavy at this time of year, and collections are very fair. Judging from the holiday trade, the people are very prosperous, as all labor is employed. The farmers report a good season in this section. A good deal of building is talked of.

Trade has exceeded our expectations. Collections are a little slow at present. Indications are good for business in 1902. Labor is well employed. Farmers are in very good financial condition.

Demand apparently better than former years, larger stock of goods. Collections rather slow, on account of failure of wheat crop. Business promises fair for 1902.

The demand was 25 per cent. ahead of other years. Crops were good, also prices. Stocks are about 15 per cent. heavier than ever before. Collections never better. Labor is better employed than for ten years. Financial condition of the farmers is good and growing better, since they are going out of the hop business. Very little new building in our vicinity.

NORTH CAROLINA.

The demand for goods in the first part of year was exceptionally good, but as it advanced it became less on account of unpromising crop prospects. The formation of large corporations, the unfavorable weather for the growing of crops, the high price of corn and the failure of that particular crop here, all of these things have, to a certain extent, hindered trade. Stocks are not very heavy and collections in this section will not be over 50 per cent. of full indebtedness. Our people a year or two ago were in a state of unexampled prosperity, and the financial condition of the farmers was good, but by reason of crop failure this year they are without money, and in order to purchase such supplies as they will actually need they will be compelled to go in debt, and it will take several years to extricate themselves. The erection of new enterprises will doubtless receive a check in this section for a short time only.

Trade was good all during the year until November 1, nearly all the business being done on "crop time." Since that time trade has been poor, caused by failure in the cotton crop. There will be a large demand here for food products next year; the farmers made no grain crop, hence they have no food on hand.

We have had a very good year. Our trade has held up well all through. Cash trade has been better than ever before. The big August rains hurt crops and affected trade to some extent. On account of high prices in some lines we have run our stock down lower than usual. Collections very good. Most of our people are fairly prosperous. All labor can find employment at good wages. The farmers are in good condition; most of them have money ahead. Large amount of building is going on.

The demand for goods has been good in certain lines. Our business has kept up to the average. The wet weather in spring and long drought in summer cut crops badly. The advances in tobacco and cotton have not made up for this shortage of crops. For that reason collections are slow and stocks are light. A great many Christmas goods will be carried over, for the reason that people have no money to buy with. It will take what they have to start out clear for the new year, and a great many will be behind then. Labor in town is employed and hard to get. Factories are running full time.

This section of the country had crop failure, due to

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hot winds. Business is not so good as in former years. Collections are slow. Carry usual line of goods.

OHIO.

The demand is over 20 per cent. better than last year. Activity in manufacturing has increased demand for labor and additional laborers make greater demand for houses, more work for mechanics, increased demand for material and better wages than heretofore. Increased wages to labor mean more money spent for necessities and luxuries. The enlargement of old factories and the building of new ones have been large factors in increasing the good times prevailing in this section. The competition that has to be met from the "wholesale-retailers" has hindered trade, not so much from the amount of goods they sell the consumer, although that is bad enough, as the undermining of confidence in the prices and the fair dealing of the local merchant. Buying goods away from home, sending money in advance and being compelled to take what is sent without a choice, is bound to result in a greater dissatisfaction than would ever arise from dealing at home. With us the farmers have been prosperous during the year. The demand for labor, skilled and unskilled, has been greater than the supply. Banks have greater deposits than ever. Loans that are safe are harder to make than heretofore. Farmers are not asking for loans. The hard times of a few years ago compelled many to neglect the necessary repairs on their buildings. These will now have to be made. The prosperity of the last two years will make necessary the enlargement of barns on the farms and factories in the towns. Contracts have already been made for a part of this enlargement. Contractors are already figuring on proposed new buildings to be erected in 1902, and the outlook for 1902 is better than it was a year ago for 1901. Within the last year or so a new line of goods has been put on the market. Farmers have found that the timber supply for fencing is about exhausted and have discovered that Woven Wire Fencing makes a better fence than timber, and the demand for Wire Fencing is on the increase.

The trade of 1901 has been excellent. Our sales are fully equal to 1900, which was an exceptional year. Trade was influenced by a great deal of building and a scarcity of goods; the party having goods was not obliged to hunt long for a market. The chief hindrance to trade was the indifferent manner in which some manufacturers filled orders. Later in the season there was a great deal of trouble with the railroads. Collections have been fair, but will have more than the usual amount of losses to charge off for the year. The outlook for 1902 is favorable. Mechanics and laborers are getting good wages, and many are spending them as fast as received. Labor in this section is fully employed at good wages. Farmers have had good crops and are getting good prices. They seem to have money to do their business and ask for very little credit. The high prices of lumber and labor will interfere with building in the country during the coming year.

The demand of 1901 was somewhat greater than in 1900. Good prices for farmers' products has caused a demand for more implements and vehicles. We do not know of any special hindrances to trade in our section of the State. Stocks are only medium. Collections have been very good. The indications for 1902 are very encouraging. All the laboring men are employed, and it is difficult to secure laborers promptly. The farmers' financial condition has not been better in the last ten years. There will be a larger amount of building in our section in 1902 than for a number of previous years.

Demand has been the greatest known. The long continued drought had bad influence in the fall. The greatest hindrance to trade has been the inability to get goods from manufacturers. Collections have been unusually good. The indications for business in 1902 are good. Most people have more money than usual, and

labor is scarce. Condition of farmers good, notwithstanding shortage of corn. Projected buildings about same as this year, and would estimate about 10 per cent. above average of past ten years.

OREGON.

The year just closing has been prosperous for this portion of Oregon. Grain, a fair yield, a good crop of hay, all kinds of fruit have turned out well, and stock interests have flourished. These influences have entered into our business life and merchants feel the new impetus in trade. Stocks are heavier at the present time than usual. Collections have been good. The people are better off financially than for many years. Creameries and skimming stations are being established in almost every locality. The farmers do not have to depend on grain raising and will thus have their labor returns coming at all seasons of the year. This city has a fine prospect of growth during the next year. Many fine residences, &c., are already planned and under contract.

Largest demand for Hardware ever known. Stocks are low. Collections are good. People generally are prosperous. Labor is scarce. Condition of the farmers is good. Large amount of building and many new enterprises.

The demand for goods in our line the past year has been the best in our history. The mining and logging trades have both been exceptionally good the past year. Our stock is exceptionally heavy for this season of the year. Collections are good, but not nearly as good as we expected. The prospects for business in 1902 are exceptionally good. People generally are in a prosperous condition. From 90 to 95 per cent. of those who want work are employed. The farmers are in better shape now financially than they have been in six to eight years. Prospects for building are good. Fully 100 new houses were put up in our little city of 4000 people this year. We expect there will be more put up next year.

Demand has been satisfactory. Crops were good and prices fair. Collections are good. My business improved 40 per cent. over 1900. The outlook for 1902 is very good. The farmers are doing very well and mechanics and laborers will be well employed. New enterprises are much talked of and probably quite a fair percentage of them will materialize, as emigration seems to be started this way now.

PENNSYLVANIA.

The demand for general Hardware has been better and more satisfactory than previous years. The demand for Builders' Hardware has far exceeded any former years. We think our city has been more fortunate in regard to the new building enterprises than most other cities, and trade that we usually have in October has held up until even now. We think stocks of Shelf Goods are pretty heavy at present. Collections and cash sales are good; in fact, never in our 20 years here have we known them better. Mechanics are all working, many overtime, and to our observation all have money to spend and are prosperous. Amount of new building is far beyond our expectations, and we look for 1902 to be the best year ever had for the Hardware trade. At present we have booked a number of large orders for Finishing Hardware for the coming year; in fact, we have more orders (and at good prices) than we furnished in an entire year of the period, 1894-1898.

The demand for supplies in our territory was for Heavy Contractors' and Builders' Supplies. Our sales increased about 25 per cent. over last year. The development of coal mining and the enlargement of our steel plant stimulated trade. The principal hindrance to trade, in our estimation, is the extortionate prices demanded by some of the manufacturers. Our stocks are below the average for this time of the year. Collections are fair. The indications for 1902 business are very encouraging. Labor is at a premium. Our farmers have

large sums of money looking for investments. Indications are for a large building boom in our vicinity.

The volume of business with us has been in excess of any previous year. Buyers appear to have had more confidence and prices have been fairly well maintained. Local conditions have been better than in some former years, as the mines have been operated steadily. Collections fair; failures for the year have been less than usual. Without doubt the laboring class have been employed more regularly and at better wages than any former year. Labor agitators have been active in this field and have kept us "stirred up" in some branch or other most of the time. We anticipate more cutting of prices in the early part of next season than was seen this year, owing to many independent factories being established to manufacture goods that have been largely controlled by combinations.

The business for 1901 has been satisfactory. There were about 650 buildings erected during the past year and all the contractors will be busy to the end of year, with plenty of work to start in the new year. The P. & R. Railway Company will spend about \$1,500,000 in new shop and equipments. Stocks are not heavy. Collections are fairly good and there is plenty of money, and every person can get work who is anxious to work. The business for 1902, according to present indications, will exceed the past year. The farmers are in good shape and receive very high prices for corn, oats, wheat, potatoes, &c.

RHODE ISLAND.

The demand has been good in every line of building ware and general line. In Hardware line we lost trade due to long time in getting stock. Orders that we took in June have just been completed by well-known manufacturers. Great annoyance has been experienced through the express companies. They lose tags, and claim they do not know who the goods belong to. After waiting a reasonable time we have to notify the shippers to learn that the goods are in our local office without a tag. Much annoyance has also been caused by the railroad side tracking goods and not getting any redress. A carload of goods from Philadelphia that should come in three or four days is three weeks out and no trace of it. Our stock is quite as large as usual this season of the year on all lines. Trade is held up and we duplicate our usual orders. Many times we could have sold them had we had prompt delivery. As it is many of the goods are on hand. Collections were good until within six or eight weeks. Since then extremely slow, which we cannot understand. The people should be much better off with good crops and all labor could do. Farmers have had only a fair season. Crops were short but prices good. Many of the Portuguese farmers made money on potatoes. Took it with them, however. This fall they brought a good supply of farm tools with them. Most of them will return by March next. A good number of buildings will be started in the early spring. Find jobbers hard competitors. About every one has two men in our territory, one looking for the jobbers' trade and the other for the building trade. They have a propensity for wanting it all.

Business very light for July, August and September, otherwise quite good. Good business indicated for 1902. Every one seems well employed and at fair wages. Mills running full. Much building going on, but factories trim even a hen coop now at special prices.

SOUTH CAROLINA.

Trade for 1901, in the main, has been satisfactory, although there has been a very perceptible falling off in the volume of business since October, compared with last year. The influences which have affected this have been a short cotton crop and a general failure of the corn crop. This, in connection with the low price at which cotton has ruled, has had a tendency to restrict trade.

For the same reasons collections have not been very flattering. Owing to trade conditions stocks are heavier than usual at this season of the year, on account of purchases having been made early in the season, anticipating better trade for the fall months than has been realized. The bad crop year of 1901 has materially affected the financial condition of the farmers, who, to a large extent will have to depend on the banks for help, and as the demand for Farm Supplies will be heavy, much of them purchased on borrowed capital, the outlook for the Hardware line is not very bright, for when conditions prevail such as we have described, we have found that the farmer is disposed to economize by restricting his purchases of Agricultural Implements, &c. This being the case, it means, of course, lighter orders from the retail dealer. Much of the white farm labor is seeking employment in the cotton mills. To what extent this will curtail the necessary labor required on the farms we are unable to say. These conditions will affect the starting up of new enterprises until another season.

The business of the year, as a whole, has been very unsatisfactory. Crops are very short and collections have been very backward. Financially, farmers are in worse condition than they have been in years, and the outlook for the coming year is that business will be very light. The majority of the farmers are in bad shape for making a crop. No new building is going on, and very little projected of any consequence.

Business for 1901 has been very satisfactory, especially the first six months. The latter part of the year business was considerably affected by the shortness of crop. My stock is heavier than ever before. Collections are slower than I have ever known, but have reason to believe I will lose very little money as I know my trade. The people in this immediate section are in worse condition than I have ever known them. Their cotton crop was the shortest in years, and corn crops were very poor. Most of our farmers are in debt, and very little in store for another year. But we have lived through hard times before, and we will live through them again. Very little improvements and building going on just now. Our people are trying to pay their debts just now, and are not thinking much about spending their money otherwise.

Our city trade has been much larger than last year, owing to the many new buildings going up and general improvement of a growing city. The country trade has hardly held its own. Owing to bad crop year some sections of our large county made but little corn, and not a few have been compelled to give up farming and go to the factories at Graniteville, Vanclose and Langley. Our city people are prosperous, plenty of labor and scarcity of men in all lines of mechanical work. Financial condition of farmers not quite so favorable as last year, but are hopeful of a better crop than the last two years.

Low price cotton and short crop makes it hard for people to pay out. Stocks are short, and not up to what they are generally. Dependent people next year will be in bad shape. The farmers who are generally good will be all right, but those who are dependent are more so than usual.

SOUTH DAKOTA.

Demands in nearly all lines have been good and healthy. Inability to get Wire Goods caused much inconvenience and loss in Tools. Stocks now are well assorted, but light. Prices are very irregular and uncertain. Collections, as a rule, have been slow, but personally we have no cause for complaint. The unusually wet and unfavorable fall, which caused great loss to farmers, seems to be the cause. Prospects are fairly good; farmers are getting in good financial condition, and many parties are coming in from surrounding States, each bringing some money with him, all of which is expended on their new homes; farm lands are worth more than double what they were two years ago. For some

The Outlook for Hardware

reason unknown to us, there seems to be something ahead that is likely to greatly disturb prices, as we have found jobbers and manufacturers both inclined to make very great concessions in prices, in order to get certain orders. Whether this is caused by their being overstocked, or whether it is on account of lack of organization on their part, we do not pretend to guess. We are looking for a reduction in price in nearly all lines. We have already bought our Glass, Nails and Linseed Oil and Barb Wire for the entire year at prices not easily affected by regular competition.

Business good the whole season in all lines. The only hindrance during the year was Barb Wire, which was hard to get. Stocks are fair. Collections good. People are in good financial condition. Plenty of building done this year, and more in sight for next year.

TENNESSEE.

During the early part of the year the demand for everything in season was good, but drought set in with summer, and has completely stagnated business in all lines at this point. Stocks are full and collections very poor, and from 30 to 60 days behind. The outlook for 1902 is not by any means flattering. Farm produce is our main stay, being almost a failure. We cannot look for much business before another crop is harvested.

TEXAS.

The demand for Hardware in general has been much lighter than last year, and rather lighter than in average years. The special influences which have caused the falling off in trade are mainly all around crop failure in this immediate section, and somewhat overtrading during last season. Hindrances to trade are too high local freight rates and keen competition from St. Louis, Louisville and Chicago jobbers, and from manufacturers of all kinds selling goods direct to the retailers. Stocks of all kinds of Hardware are rather heavy in this locality considering the demand. Collections are the worst and losses on bad debts the heaviest I have ever experienced. The only redeeming feature is that the year 1900 was a very prosperous one, with crops good and price of cotton very high, the good effect of which is not wholly obliterated. The mass of people in this section cannot be considered prosperous at this time. Common labor is abundant and cheap, and the demand for employment rather urgent. The financial condition of the farmers cannot be considered good, as many of them have not been able to pay their indebtedness in full. As a consequence of prosperous conditions for the year 1900, a great many buildings and improvements were started during the year 1901, and this movement has not had time to exhaust itself; therefore there are a great many more buildings and improvements under process of construction than the present business condition would warrant. The much dreaded boll weevil has made its appearance in large armies. If this insect pest is not stamped out by natural or artificial means the outlook for the next year's cotton crop is rather gloomy, consequently the result of next year's business is somewhat doubtful.

Trade up to the average. Collections not so good; considerable cutting in prices; crops poor; cash business for first half of 1902 will be poor; amount of credit business will depend on crop prospect. We look for poor trade in January and February. Stocks are heavier than usual, failures greater than customary. Labor is well employed now, and will be the balance of this year. We look for considerably less building in 1902 than in 1901 and 1900. Banks have materially less money now than one year ago and a greater demand. Farmers are not in good shape.

Trade is very dull, caused by failure of corn crop and shortage in cotton crop. Stocks are heavy. Collections very poor. Trade will be dull until another cotton crop

is made. Farmers are not in as good condition financially as last year. No new enterprises, everything is quiet.

The first half of 1901 the demand for goods was better than for years, the effect of the 1900 prosperity. Generally speaking, farmers had their debts all paid and some money left over from 1900, and they spent it on improvements. The last half of 1901 was exceedingly disappointing in a business way, as trade dropped to one-half of 1900, and collections very bad, all on account of the short crop and very low price of cotton. The corn crop was almost a failure for want of rain, and the small grain crop generally was not a howling success. Stocks are heavier than they have ever been at this season of the year, from the fact a great many goods are purchased in the spring for fall business, and the business did not come. If the manufacturers do not find a limited demand for goods the first half of 1902, then we are no prophets. For reasons above mentioned, we do not believe the indications for business for 1902 are good. Farmers seem to be prosperous and have money, but they are panicky and not spending it, but are looking for a brighter outlook of a new crop. It does not rain enough. No rain, no crops. Some fine residences are going up, creating a demand for fine shelf goods.

Trade conditions are not good this year. The short cotton crop is one cause. The year 1900 was a very good year, and money went in payment of debts. We are now suffering from bad collections. There will be next year a big demand for credit and extension of paper. Stock men are short of grass, on account of the protracted drought. Feed of all kinds is scarce and high. We think speculation in oil, lard and oil stocks has added somewhat to the trouble.

The prospects for 1902 are just as bad as can be. No rain to amount to anything for 16 months. No crops made. Feed enormously high and draining the country of cash. No grass, and prospect of a big die off in cattle and other stock; small grain dying.

UTAH.

Trade for 1901 has been satisfactory in all lines, and shows a marked increase over 1900. The number of dividend paying mining properties which have been added to the list during the year has had a good effect on the demand for mining supplies. We look for steady and healthy trade conditions for 1902.

VERMONT.

The demand for merchandise in our line in this locality has been much greater than for many years, owing to street railway construction, the construction of new power works for electrical purposes and new buildings. We are carrying a complete stock of everything in our line, although we are not overloaded in anything. We find collections fair. All mechanics, carpenters, masons and men of other trades are fully employed, so that it is hard work to find any one to do work for you except by making engagement ahead. The farmers have had a good year, but have found it difficult to find enough men to help them. There are indications of considerable new building for 1902.

Trade has been good in 1901. General demand has been better than for several years. Collections fair, stock well up. Labor has been well employed at fair wages. Catalogue houses and department stores are still, we believe, a "thorn in the side" of all regular dealers. The outlook is seemingly bright. The farmers are obtaining good prices and general prosperity seems to prevail at present in our section. Not much of new enterprises or building is now in sight, but the present prosperous condition would warrant somewhat more than the usual amount of building and repairing in 1902.

Business good. Collections fair. Prospects are first class for 1902. Labor scarce.

VIRGINIA.

We have found the demand for Builders' Hardware very good throughout the entire year. We have generally found heretofore that about the middle of November there has been a material decrease in the demand for Hardware, but this year the trade has continued active right up to this time. We attribute this to the fact that we have had very mild and open weather, which has enabled the builders to do outside work as readily as in the summer time. Then again, the building operations have been somewhat heavier this year than formerly, and owing to the great activity in building operations throughout the country the dealers here have found it difficult to obtain the necessary supplies and the result has been that many buildings have remained unfinished until late in the season. So far as our information goes our local dealers are all well stocked up with goods, as they seem to be looking forward to a good season early in the coming year. Our own stock is more complete than it has been. We think collections are about up to the average—nothing to boast of—but by giving them close attention we have been enabled to keep them up to this point. We are inclined to think that we can look for a fairly good business in 1902. Locally we do not think there will be any more building than there has been this year, as we know of no reason for any other expectation. Our section is quite a thrifty one, as we have many diversified interests that produce money. Locally we have very many enterprises that employ labor—so much so that there is no reason why any man should be idle who wants work. There is probably not a more prosperous set of agriculturists in the country than the truck farmers who reside in our county and transact their business in this city, their products bringing in several millions of dollars annually. While we understand that the prices for their products have not been as good as usual during the past season, yet they seem to be in a very good financial condition. As to new buildings and enterprises, we may look for considerable development along these lines during the next year.

We have had a prosperous year and find collections rather better than usual. We find that it is difficult to get goods promptly from the manufacturers. This is the principal hindrance to trade. The demand for goods must be in excess of the supply, or else the manufacturers are curtailing production to keep up prices. The high prices now prevailing for all farm products should make business brisk in agricultural sections and in mining and manufacturing districts, where labor finds steady employment, there should be a healthy and prosperous condition of trade. If employers and employed come to their senses and reach a reasonable basis of settlement for all differences arising between them this country will see the year 1902 one of the most peaceful and prosperous in the annals of its history.

The demand has been good. Have had the best business in our history. Crops in this section all good. Stocks are light. People are in good financial condition, farmers having more money than for many years. The valley of Virginia never raised such a corn crop as this year. We expect good business in 1902.

WASHINGTON.

Trade has been better the past year than for the eight years previous. The demand is for better qualities of goods. Our stocks are larger than previous years. The indications for business the coming season are at present very promising. Our present success is partly due to the great mining business going on in Alaska, and the prospect of greater business with China and Japan. This year has been a most prosperous one, and the indications point to a more prosperous new year. Fish, lumber, mining and the product of the farm contribute to our great prosperity.

The demand in our section of the country has been somewhat heavier this year. An average amount of goods on hand with us. Collections have been very

good. The people are in better condition than ever before. Crops were good and all prices satisfactory, except for wheat. Farmers are buying more cattle and planning to go out of wheat raising entirely.

WEST VIRGINIA.

Taking into consideration the fact that we have used more money in our business in 1901 than in 1900, that the population is somewhat larger than it was one year ago and that we have covered more territory, we have been able to increase our business, but we do not think that the demand for Hardware in 1901 has been quite as great as it was in 1900. We can account for that partly in this locality from the fact that a large percentage of our trade comes from the coal business, and as a large corporation have attempted to combine the coal business of this State, and in some sections succeeded, the individual mine owner has bought very sparingly, and in some cases has allowed his mine to become very much in need of repairs, expecting daily to dispose of his plant. This has been one of the special influences that has affected trade. We find the stocks with us much larger at this season than ever before at the same time of the year, brought about by inability of the factories to fill orders in any reasonable time. We find the factories as much behind on their orders to-day as they were a year ago, while some factories in some lines are able to do a great deal better than they did a year ago. The financial condition of the people is fair. While labor brings a good price and all labor can find employment, still the cost of living at this time is more than it has been for years past, but we believe this will be overcome in the year 1902. The farmer did not harvest as good a crop as usual by about one-third, and, while he could get more for what he could sell, he has but little to dispose of. Therefore we believe the farmer is far from having the amount of ready cash that he had one year ago. The outlook for building in 1902 is very encouraging. The prospects are that we will have more new buildings in this vicinity than we have had for many years past. West Virginia is comparatively a new field, but with its vast mineral wealth it is high time that it made some show in the building line.

About an average trade. Sales will fall short slightly of 1900, on account of the extremely high prices on Window Glass and Windows and Doors, which line we had almost let go. Stocks at present very light. Collections very poor. The worst feature of collections is the present bankrupt law, which allows any common laborer to take advantage at a cost of about \$50. This law should be repealed. Our people, while poor, are fairly prosperous and are making some progress. Labor is well employed and at fair wages. The financial condition of farmers is good. Crops only common, but price of farm products good. Buildings are contemplated which will employ labor fully for next year.

Business good. The demand for all classes of goods has been in excess of any previous year. One of the special features that has helped to improve business is that the farmers have been having good crops for several years and have also been getting good prices, and in our city the demand for labor has been large, so that every one wanting work could get it, and at better wages than previous years. With the merchants stocks are full, with good sales and easy collections for credit given. The retail credit business is much less than former years, in consequence of people's ability to pay cash. For the season of 1902 we see nothing to change the situation as it has been for 1901. Farmers are prosperous, and there is considerable in the way of new buildings and new enterprises to start with the opening of spring.

WISCONSIN.

Business in general has been extra good in 1901. Building Materials, Barb Wire and Woven Wires in great demand nearly all the year, and Stoves sold well the last part of this fall. Furnaces are coming in style more and more. Stock medium. Collections good. A local bank

failure put a check to business in general, and if it had not been for this 1901 would have placed all former years in the shade. Catalogue houses are the only hindrances to the retail trade. With a standing offer to all that I make the same prices on the same terms this can be overcome to some extent. The outrageous prices on Enamelled Ware keeps the sales on that article down. This being a farming community the people in general are well to do, on account of the good prices in barley, which is the main product. The outlook for 1902 is good for Building Materials and Wires for Fencing.

Best trade in our history—good crops and good prices. Manufacturers unable to fill orders promptly, if at all. Stocks rather light. We are out of Coal Heaters, Steel Ranges, Wire, some sizes of iron, wood stock, that we have been unable to get. Collections are good. People prosperous. Our bank deposits and county records show that. No unemployed here. No strikes. Farmers as a rule prosperous. Nearly every one making improvements of some kind.

Our volume of business was greater in 1901 by 25 per cent. than any previous year. Because crops were good, prices were good and money was easy at low rates, and no man was idle. Collections are good. Stocks are light. People in this vicinity are prosperous. Labor is all employed at steady work and good pay. Farmers all have money, carry two pocketbooks, and their lands have doubled in value in the last three years. Building outlook is great.

General business has shown an increased demand over former years. Good crops and good prices have had much to do with it. Our mills have been running full time at fair prices. All mechanics have been scarce, also laborers. Scarcity in Wire and Wire Goods has been very annoying, as it looked as if it was entirely artificial. Stocks generally are light. Collections are only fair, except with farmers. Everybody is at work, with good wages. A great deal of new building. Farmers have so much money they don't know what to do with it.

Nineteen hundred and one has been the best year we have ever had as to volume and collections have been about normal. Confidence is well seated in the public mind, and that is our idea of the cause. Shortage of goods has caused trouble. Everything prosperous, but think the pendulum will swing slowly back to normal, and 1902 will be about the same as 1900. Farmers are paying up and making somewhat more improvements than heretofore.

HARRINGTON & RICHARDSON ARMS COMPANY.

IN 1871 F. Wesson and Gilbert H. Harrington started at 18 Manchester street, Worcester, Mass., in a very small way to manufacture one style of a single action Revolver fitted with a shell ejecting device invented and patented by Mr. Harrington. It is said to have been the first successful device applied to Revolvers for ejecting empty shells without removing the cylinder. Mr. Wesson's interest was bought out in 1874 by Mr. Harrington, who shortly afterward formed a partnership with William A. Richardson, under the firm name of Harrington & Richardson. The business was rapidly growing, and in 1876 it became necessary to move to more commodious quarters at 31 Hermon street. Four years later the firm became sole licensees to manufacture in the United States double barrel hammerless Shotguns under the Anson & Deeley patents. These Guns ranged in price from \$85 to \$300, and during the five years they were manufactured won an enviable reputation for durability, simplicity, accuracy and finish.

In 1888 the business was incorporated as the Harrington & Richardson Arms Company, since which time it has had a steady and healthy growth, due to the fact that the Harrington & Richardson Revolvers are made

with the same precision and accuracy in every part that would be required in constructing a fine watch. The company advise us that each Revolver or Gun manufactured by them is made with the same care and the same regard to absolute safety as though the entire reputation of the company was at stake on each one. In 1893 the erection of the present main four-story and basement factory building, at the corner of Park avenue, Chandler and Abbott streets, was begun and it was completed in the spring of the following year. It covered an area 50 x 180 feet, affording accommodations for the 250 men then employed. A two-story and basement addition, 50 x 60 feet, was built in 1900, and another addition, 50 x 90 feet in area, and four stories and basement in height, has just been completed. The present number of employees is over 500. Their catalogue now shows 157 separate and distinct Revolvers beside Automatic and Non-Ejecting Single Guns in two gauges, with both steel and twist barrels. About January 1 they will also be able to supply these Guns in 20 gauge.

THE ADAMS & ELTING COMPANY.

THE ADAMS & ELTING COMPANY, manufacturers of Paints, Chicago, have brought out three interesting catalogues descriptive of some of their Ad-El-Ité specialties. One catalogue treats of Iron Bedstead Enamels, showing samples of 21 tints. These Enamels consist of Art Lacquers of dead finish and Enamels of gloss finish. The Lacquers are stated to dry perfectly hard in half an hour, presenting a finish which cannot be chipped, washed off, nor glossed up with rubbing. The Enamels are furnished in many tints and cover thoroughly in one coat except the very delicate tints, which require two coats. These Enamels dry perfectly hard in 12 to 14 hours and can be baked at 150 degrees. The second circular relates to tinted Enamels, which are shown in 18 tints and are adapted for application to any surface, such as walls, furniture, iron beds, radiators, lawn chairs, or interior finishing of houses. The third pamphlet is intended for the information of consumers of Paints and gives many practical suggestions how to refinish the interior and exterior of a home and improve the appearance of the contents generally by the use of the Ad-El-Ité specialties.

THE GRIFFIN MFG. COMPANY.

THE GRIFFIN MFG. COMPANY, Erie, Pa., who have been best known as manufacturers of Shelf and Folding Brackets, recently added a line of Door Bolts and are now ready with a full line of Strap and T Hinges, Hasps, &c., and it is understood that they will follow with other goods of this class. The new plant into which they moved, and reference to which was made in these columns some time since, is equipped with every convenience for the rapid and economical production of their various lines of goods.

THE annual automobile show at Chicago will be held at the Coliseum March 1 to 8, 1902. It will be under the auspices of the Chicago Automobile Club and the National Association of Automobile Manufacturers. The Coliseum has been enlarged by the addition of an annex, 75 x 175 feet, and now affords 65,000 square feet of floor space, as well as meeting rooms, a concert hall, &c. Most of the space for exhibition purposes has already been taken, but there is still some to be had. Information in regard to the show may be obtained by addressing Samuel A. Miles, manager, Monon Building, Chicago.

WILLIAM H. COLE of Tower & Lyon, 95 Chambers street, New York, is making another trip across the continent, when he will visit all the principal points on the Pacific Coast. He will be accompanied by Mrs. Cole. In connection with the pleasure of the trip Mr. Cole will give some attention to business, and will doubtless be a close observer of business conditions in the important territory visited.

Reading Transom Lifter.

The Reading Hardware Company, Reading, Pa., and 96-98 Reade street, New York, have just put on the market the Reading transom lifter, as here illustrated. This lifter differs from others now on the market in several particulars. Probably the most attractive feature to the



Fig. 1.—Reading Transom Lifter.

dealer is the fact that this lifter does away entirely with carrying a number of styles to operate transoms hung in various positions, and the difficulty of deciding whether a certain style will suit the purpose for which it is intended to be used. The Reading transom lifter can be applied in nine different ways without changing any of

the door by simply turning an adjusting screw. Only one hand is required to operate the lifter. Pulling the thumb piece forward releases the grip and allows the transom to move freely up or down. The steel clamping device is automatic, and so constructed that the transom cannot slip or fall. By merely letting go the thumb piece the rod

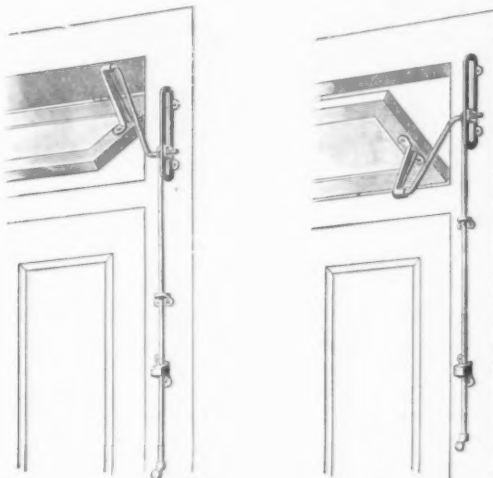


Fig. 2.—For Recessed Transom.

Fig. 3.—For Flush Transom.

is instantly locked. Each lifter is complete in itself, all the parts being joined together ready for use. The lifters are made in bronzed iron and bronze metal, of various lengths from 3 to 6 feet, $\frac{1}{4}$ and 5-16 inch diameter.

Adjustable Divider.

Smith & Hemenway Company, 296 Broadway, New York have just brought out the No. 186 adjustable divider here illustrated. This divider can be extended to 8 inches in length or shortened to 5 inches, by means of the thumb screws on each leg. A fine adjustment of the points in use is made by means of the lower milled head screw, while the thumb screw and checkered plate above the pivot locks the legs of the divider rigidly in any desired position. It is made entirely of steel, polished and nicked. An arm to carry a lead pencil where the dotted lines are shown can be supplied if necessary.

The Scranton Mercantile Company, Scranton, Pa., have removed to offices 413 and 414 Commonwealth Building. They have recently completed a large order of Cast Iron Water Pipe for Buffalo, N. Y. They are very busy in their iron and steel branches and are filling several large contracts. They also report unusual action in Leather Belting, Cotton Waste and Wire and Manila Rope. The company believe that with the strike conditions overcome the Scranton district will enter upon a period of unprecedented prosperity.

L. R. MAY, one of the oldest Cutlery salesmen in this country, after having retired from the road a year ago,



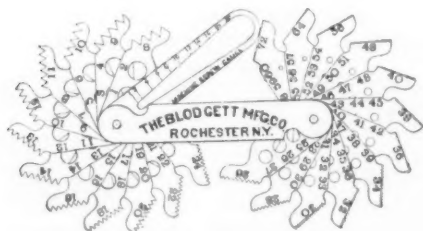
No. 186 Adjustable Divider.

the parts, and it will work equally well whether transoms are top, bottom or center hung. It can be used on transoms fitting flush with the door casing, or recessed to any depth up to 6 inches, without changing any of the parts. To escape a projecting bead or molding, the lifter can be placed at the required distance from the edge of

has decided to resume his former active life as a traveler for Adolph Kastor & Bros., 109 Duane street, New York. Mr. May was originally seven years with Vom Cleff & Co., then 13 years with McCoy & Sanders part of the time as partner, and then nine years with Alfred Field & Co.

The Blodgett Machinists' Gauge No. 7.

The accompanying cut represents one of a variety of gauges offered by the Blodgett Mfg. Company, 187 State street, Rochester, N. Y. The gauge differs from the company's No. 2 in having a machine screw gauge



The Blodgett Machinists' Gauge No. 7.

assembled in place of a center gauge. It is referred to as making a convenient combination, weighing 2 ounces, measuring $\frac{1}{2}$ inch square and 3 inches long. Machine screw gauges are manufactured separately by the company, as are also twist drill gauges.

The O. K. Tool Holders and Tools.

The accompanying cuts represent tool holders and tools introduced by the O. K. Tool Holder Company,

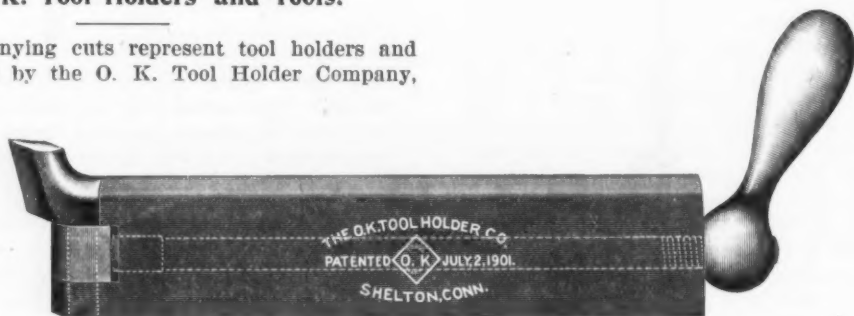


Fig. 1.—The O. K. Tool Holder, Size B.

Shelton, Conn. The holder, Fig. 1, is so constructed, it is explained, as to hold the tools as firmly as though they were a portion of the holder itself, a quarter turn of the handle serving to release the tool and allow another to be inserted. It is remarked that the holder possesses peculiar advantages which make it especially useful when it is necessary to change tools often. With the holder the company furnish all shapes of tools in common use,

are referred to as being drop forged from the best quality of Jessop tool steel, and accurately ground for clearance. It is stated that any tool can be furnished promptly and at a price less than the cost of redressing and grinding an old style tool. The company have ready for the market three sizes of holders and tools. Size A, $\frac{3}{8}$ x $\frac{3}{4}$ inch; size B, $\frac{1}{2}$ x 1 inch and size C, $\frac{5}{8}$ x $\frac{1}{4}$ inch. The A size is designed for use on foot lathes and for amateur work. Size B is adapted to 12 to 14 inch lathes and size C is adapted to 16 to 20 inch lathes. Working sets are also made in A, B and C sizes, designed to be placed at each lathe. These consist of a holder, case and 13 assorted tools. These sets sell for half the price of the full sets. The idea is that a few of the complete sets may be kept in the tool room, and the fixtures taken out on check, as they will fit any holder that the operator may have in his working set.

The Keystone Safety Shackle Hook.

The Keystone Drop Forge Works, Philadelphia, Pa., are placing on the market the safety shackle hook shown herewith, the dotted lines indicating the position of the parts of the hook when ready to open or unlock. The quick acting pattern has a shackle bar which, it is ex-

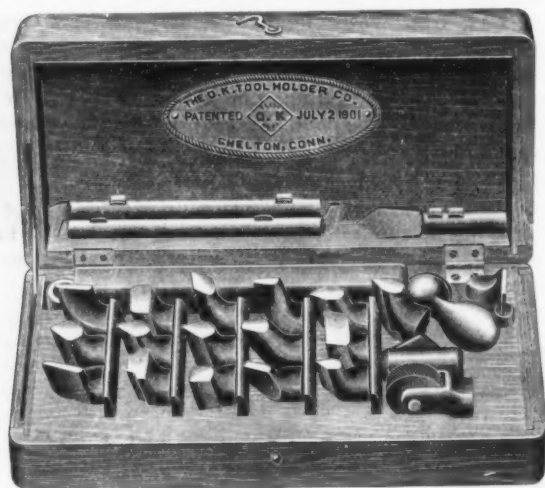


Fig. 2.—Complete Set of Tools with Holder, Size B.

Fig. 2, and are not limited to one special shape. Any of these tools can be removed from the holder and another substituted without disturbing the holder when once placed in position on the lathe or shaper. As this change can be made instantaneously, time is saved. The tools

plained, can readily be detached, and is adapted to use among stevedores, contractors and for such places in which the load is attached, lifted steadily to any given place and then released. Attention is directed to the fact that the close fitting pattern has a tight fitting



The Keystone Safety Shackle Hook.

shackle bar which cannot become detached by accident, under any circumstances, and is therefore adapted to use in connection with tackle blocks, overhead rigging and in any place where an absolutely safe attachment is desired. The manufacturers claim that the hook will insure against loss of life or property, as the result of a hook pulling out or breaking while under strain.

Warren's Catalogue and Stationery Cabinet.

An illustration is given herewith of a new style of catalogue and stationery cabinet, which has just been placed on the market by the J. D. Warren Mfg. Com-

pany, is referred to as being perfectly smooth, and as fitting perfectly on the rump. The breeching proper—the large piece around the hips—is rounded and curved in such a manner as to conform to the shape desired, and is made in different lengths to suit animals of various sizes.



Warren's Catalogue and Stationery Cabinet.

pany, Masonic Temple, Chicago. This cabinet is 54 inches high, 54 inches wide and 16 inches deep, the right half being arranged with adjustable shelves, which can be lowered or raised to suit the height of catalogues or periodicals, the left half being fitted with 20 drawers of varying sizes and a single sliding shelf. The drawers are well assorted to suit the convenience of business men in general, and the sliding shelf is intended to be used for resting a catalogue or drawer on it when the contents are being examined. This cabinet was designed as a result of an inquiry from a customer, who desired a cabinet which would relieve his desk, its top, its writing space, its drawers, the office table, the shelves and the floor from a variety of miscellaneous printed matter; circulars, price-lists, periodicals, catalogues, letter heads, envelopes, stationery, electrotypes and small samples, the cabinet to be so constructed that there would be suitable space for all, with each arranged separately so that any information could be quickly obtained or any article easily found. We are advised that the cabinet proved to be an instant success when brought out, orders having been booked from a large number of concerns.

Quin's Flexible Metallic Breeching.

The accompanying illustration represents a flexible metallic breeching for use on horses or mules, put on the market by the Washington Metal Breeching Company, Washington, Ga. The device is made entirely of cold rolled bending steel. The hip and back straps are $\frac{3}{4}$ inch in width, with links 2 inches long connected by steel wire loops. The links are rounded on the side which works next to the animal, to avoid sharp or rough edges, which would annoy the animal. The crown plate

The metal is turned over No. 10 steel wire to render breaking or getting out of shape impossible. The entire breeching is referred to as being flexible and adjustable,



Quin's Flexible Metallic Breeching.

as not being stiff or awkward, with an absence of rattling or creaking.

C. H. Miller Hardware Company, Huntingdon, Pa., have lately taken possession of their fine new building at 708-714 Washington street. The building, which is devoted entirely to their business, has a frontage of 75 feet, is three stories high and contains 30,000 square feet of floor space. It is equipped throughout with modern conveniences and improvements.

The Model Porcelain Cigar Case.

The Wilke Mfg. Company, Anderson, Ind., have brought out the porcelain cigar case herewith illustrated.

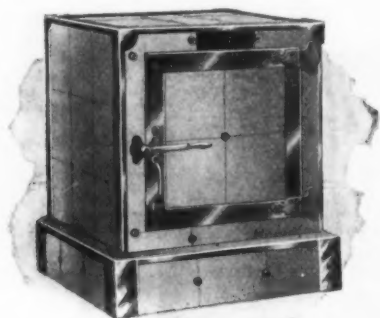


Fig. 1.—The Model Porcelain Cigar Case.

This is manufactured on the same plan as their porcelain refrigerators, having nothing about it to corrode. The exterior is constructed entirely of white glazed tile with an extension base on all four sides. The interior is a full tile lining insulated on all sides, having the top and bottom protected by a 2-inch course of mineral wool inclosed in water and air proof sheathing. The hardware

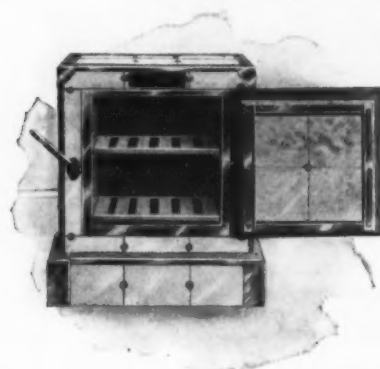


Fig. 2.—The Model Cigar Case Open.

and trimmings are of solid brass, nickel plated. The door is fitted with a fine cabinet lock. A number of the interior tiles are left unglazed, making them highly absorbent of moisture. By saturating these unglazed tile or "clay biscuit" with water, a moist atmosphere is assured within the box without any possibility of danger from mould, it is explained, enabling cigars to be preserved indefinitely, besides keeping them moist and at an even temperature. The case is 19 $\frac{1}{4}$ inches wide, 18 $\frac{1}{2}$ inches deep and 22 inches high, having a capacity for holding 500 cigars.

The Twentieth Century Tack Pullers.

The Henry & Wright Mfg. Company, Hartford, Conn., are offering the tack pullers shown in the accompanying



Fig. 1.—Twentieth Century Tack Puller No. 1.

illustration, which are one-half the actual size of the goods. They are designed to overcome certain imperfections which are referred to as existing in wooden handled

pullers. The handles of the pullers illustrated are made of iron with japanned finish. The hardened jaws of the pullers are firmly riveted to the handles, thus making them practically unbreakable, if used only for pulling tacks. It is pointed out that they also have the advan-

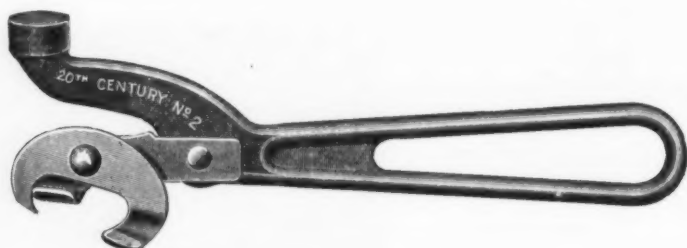


Fig. 2.—Twentieth Century Tack Puller No. 2.

tage of taking up little space, and that they are light enough to make them convenient articles for mail order trade.

Phillips' New Patterns of Screen Doors.

The accompanying cuts represent new patterns of screen door put on the market by the A. J. Phillips Company, Fenton, Mich. Style X Y, shown in Fig. 1, is made from pine, natural finish, with two coats of varnish. Twenty beechwood spindles are used at the top and center of the door. The scroll work is referred to as modest, and as harmonizing with the turned work. In each of the corner brackets is a beaded ball of beechwood, not clearly shown in the cut. Style Z, illustrated in Fig. 2, is similar in construction, while the lower half is filled

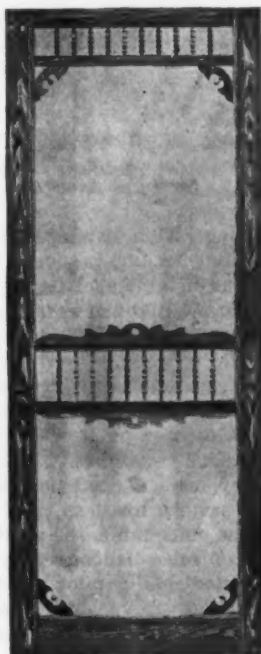


Fig. 1.—Screen Door, Style X Y.

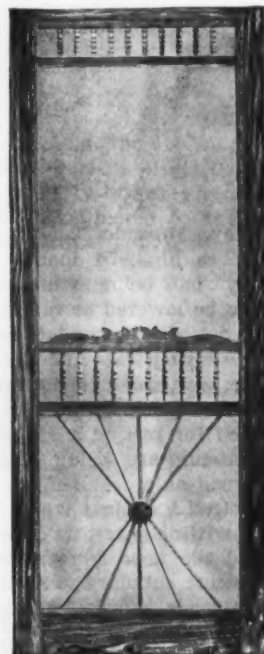


Fig. 2.—Screen Door, Style Z.

with double fans of beechwood rods, which radiate from a beechwood rosette in which the rods are glued. The wire cloth in the lower half of the door is thus protected. Both styles of doors are made for the Eastern trade, $\frac{7}{8}$ -inch thick, with 4-inch stiles, and for the Western trade $1\frac{1}{8}$ -inch thick with 3-inch stiles.

Hardman & Leatherman and Shirley Bros., Orleans, Ind., have consolidated their interests under the style of the Orleans Hardware Company, who have been incorporated under the laws of Indiana. The line carried by the company embraces Hardware, Implements, Stoves, Building Material, Wagons, Buggies, &c.

Current Hardware Prices.

REVISED DECEMBER 31, 1901.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer, are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33½@33½&10% signifies that the price of the goods in question ranges from 33½ per cent. discount to 33½ and 10 per cent. discount.

Cut Prices.—In the present condition of the market there is a good deal of cutting of prices by the jobbing trade, whose quotations are often lower than those of the manufacturers.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE INDEX SUPPLEMENT (April 4, 1901), which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters Blind—

Domestic, 7 doz. \$3.00...33½@33½&10%
North's...33½@33½&10%
Zimmerman's See Fasteners, Blind.

Window Stop—

Ives' Patent...35&5
Taplin's Perfection...35&5

Ammunition—See Caps, Cartridges, Shells, etc.

Anvils—American—

Arm and Hammer, Wrought...35&5
Buel's Patent Traction...35&5
Eagle Anvils...35&5
Hay-Budden, Wrought...35&5
Horsehoe brand, Wrought...35&5

Imported—

Peter Wright's...35&5

Anvil, Vise and Drill—

Millers Falls Co., \$18.00...20%

Apple Parers—See Parers, Apple, etc.

Aprons, Blacksmiths'—

Hull Bros. Co.
Lots of 1 doz...35%
Smaller Lots...35%
Lots of 8 doz...35%

Augers and Bits—

Com. Double Spur...70@70&10%
Boring Machine Augers...60&10@10@70&10%

Car Bits, 12-in. twist...60@60&10%

Jennings' Pattern...60&10&10%

Auger Bits...60&10&10%

Ford's Auger and Car Bits...40&10%

Forster Pat. Auger Bits...35&5

C. E. Jennings & Co.
No. 10 ext. lip, R. Jennings' list...40%

No. 30, R. Jennings' list...50%

Russell Jennings...35&10&5

L'Hommiedieu Car Bits...15&10&5

Mayhew's Countersink Bits...45%

Pugh's Black...30%

Pugh's Jennings' Pattern...35%

Snell's Auger Bits...60&10%

Snell's Bell Hangers Bits...60&10%

Snell's Car Bits, 12-in. twist...60%

Wright's Jennings Bits (R. Jennings' list)...50%

Bit Stock Drills—

Standard List...65@65&5%

Expansive Bits—

Clark's small, \$18; large, \$25...50&10%

Lavigne's Clark's Pattern, No. 1, 7 doz...55&10%

Q. E. Jennings & Co., Steer's Pat...35&5

Swan's...35&5

Gimlet Bits—

Common Double Out, gro. \$3.25@3.75

German Pattern...gro. \$3.35@4.50

Hollow Augers—

Bonney Pattern, per doz. \$11.00@11.50

Ames...35&10%

New Patent...35&10%

Universal...35&10%

Wood's Universal...35%

Ship Augers and Bits—

Ford's...40%

Snell's...40%

C. E. Jennings & Co.
L'Hommiedieu's...15&10%

Watrous'...40%

Awl Hafts, See Hafts, Awl.

Awls—

Brad Awls:
Handled...gro. \$3.75@5.10

Unhandl'd, Shouldered, gro. \$3@5.10

Unhandl'd, Patent...gro. \$6@7.00

Peg Awls:
Unhandl'd, Patent...gro. \$1@3.40

Unhandl'd, Shouldered, gro. \$3@7.00

Scratch Awls:
Handled, Common, gro. \$3.50@4.01

Handled, Socket, gro. \$11.50@15.00

Awl and Tool Sets—See Sets, Awl and Tool.

Axes—

First Quality, best brands...\$5.50@5.75

First Quality, other brands...\$5.50@5.75

Jobbers' Special Brands:
Good Quality...\$4.50@4.75

Best Quality...\$5.00@5.25

Cheap, Handled Axes...\$3.50@5.75

Beveled, add 5c doz.

File Grasso—See Grasso, Axi.

Axles—

Concord, Loose Collar...4½@5c

Concord, Solid Collar...4½@5c

No. 1 Common...3½@4c

No. 1½ Com. New Style...3½@4c

No. 2 Solid Collar...4½@5c

Nos. 11 to 14...70@70&10%

Nos. 15 to 18...75@75&10%

Nos. 19 to 22...75@75&10%

Boxes, Axi—
Common and Concord, not turned...lb. 4½@5c

Common and Concord, turned...lb. 4½@5c

Half Patent...lb. 4½@5c

Balances—Sash—
Caldwell new list...50%

Fullman's...50%

Spring—
Spring Balances...50&10@5&10&5%

Chatillon's:
Light Spr. Balances...40&10%

Straight Balances...40%

Circular Balances...50%

Large Dial...50%

Polouze...50%

Barb Wire—See Wire, Barb.

Bars—Crow—
Steel Crowbars, 10 to 40 lb., per lb...2½@3c

Beams, Scale—
Scale Beams, List Jan. 15, '95...40&10%

Chatillon's No. 1...30%

Chatillon's No. 2...40%

Beaters—Egg—
Standard Co.:
No. 9 Rapid...\$4.50

No. 10 Dover Family Size...\$5.50

No. 15 Dover Hotel Size...\$12.00

Rival...\$4.00

Taplin Mfg. Co.:
No. 60 Improved Dover...\$7.50

No. 75 Improved Dover...\$7.50

No. 75-2 Imp'd Dover, Tin'd...\$8.00

No. 100 Improved Dover...\$8.00

No. 102 Improved Dover, Tin'd...\$8.50

No. 150 Improved Dover, Hotel...\$15.00

No. 152 Imp'd Dover, Hotel...\$15.00

Lyon's Standard size...\$7.50

Wonder (S. S. & Co.)...\$7.50

Bellows—
Blacksmith, Standard List...70@70&10%

C. E. Jennings & Co., Blacksmith...60&10%

C. E. Jennings & Co., Hand...33&5

Blacksmiths—
Inch...30 35 40 45 50 55 60

Each...\$3.50 3.75 4.00 4.25 4.50 4.75 5.00

Extra Length:
Each...\$4.00 4.50 5.00 5.50 6.00 6.50 7.00

Molders—
Inch...9 10 11 12 13 14 15

Doz...\$5.75 7.50 8.50 9.50 10.50 11.50 12.50

Hand—
Inch...8 9 10 11 12 13 14

Doz...\$3.75 4.25 4.50 5.00 5.50 6.00 6.75

Bells—Cow—
Ordinary goods...75&5@75&10%

High grade...70@70&10%

Jersey...75&10%

Texas Star...50%

Door—
Abbe's Gong...45%

Barton Gong...50%

Home, B. & E. Mfg. Co.'s...55&10%

Lever and Pull, Sargent...40&40&10%

Yankee Gong...35%

Hand—
Hand Bells, Polished...60&5@65&5

White Metal...55&5&10%

Nickel Plated...55&5&10%

Swiss...60@60&10%

Silver China...55&5&10%

Miscellaneous—
Farm Bells...lb. \$1@1.40

Steel Alloy Church and School...50&10&50%

National Bell Foundry Co.:
Superior Cast Steel Church and School...50&10&50%

Bells...50&10&50%

Belting—Rubber—
Agricultural (Low Grade)...75&10@80%

Common Standard...75@75&10%

Standard...70@70&10%

Extra...60&10&50%

High Grade...50&10@50&10&50%

Best Belting Co.:
Seamless Stretched, Imperial...\$3.50

Boston...50&5

Niagara...60&5

Leather—
Extra Heavy, Short Lap...50&10@60%

Regular Short Lap...60@60&5%

Standard...60&10@65&10%

Light Standard...65@70%

Leather Lacing...60&10%

Cotton—
Rosendale-Reddaway, B. & H. Co.:
Sphinx Brand...60&10%

Durable Brand...70%

Bench Stops—See Stops, Bench

Benders and Upsetters,
Fire—
Green River Tire Benders and Upsetters...30%

Stoddard's Lightning Tire Upsetters...40&30%

Bicycle Goods—
John S. Leung's Son's 1899 list:
Chain...50%

Spokes...50%

Spokes...50%

Tub...60%

Bits—
Auger, Gimlet, Bit Stock Drills, etc.—
See Augers and Bits.

Bit Holders—See Holders.

Blind Adjusters—See Ad-

justers, Blind.

Blind Fasteners—See Fast-

eners, Blind.

Blind Staples—See Staples,

Blind.

Blocks—Tackle—
Common Wooden...70&10@75%

Cleveland's teel...60&10@70%

Ford's Star Brand Self Lubricating...50&10%

Hollow Steel, Ford's Pat. Star Brand...50&10%

Lane's Patent Automatic Look and Junior...30%

Stowell's Novelty, Mal. Iron...50&10%

See also Machines, Hoisting.

Boards Stove—
Zinc, Crystal, etc...40&10@45%

Boils—
Carriage, Machine &c.—
Common, list Jan. 30, '95...65&25@65%

Norway Iron, \$3.00 list May 24, '99...80&80&5%

Phila. Eagle, \$3.00 list May 24, '99...80&80&5%

Bolt Ends, list Jan. 30, '95...70&5@70%

Machine, list Oct. 1, '99...70&5@70%

Machine with C. & T. Nuts...65&75@65%

NOTE—The rapid advances in manu-

facturers' prices enable the jobbers to cut

prices freely.

Door and Shutter—
Cast Iron Barrel, Round Brass

Knob:
Inch...3 4 5 6 8

Per doz...\$3.25 3.50 3.75 4.00 4.75

Cast Iron Spring Foot:
Inch...6 8 10

Per doz...\$1.00 1.25 1.75

Cast Iron Chain, Flat, Japanned:
Inch...6 8 10

Per doz...\$0.75 1.05 1.30

Cast Iron Shutter, Brass Knobs:
Inch...6 8 10

Per doz...\$0.87 1.00 1.00

Wrought Barrel Brass Knob:
Inch...3 4 5 6 8

Per doz...\$0.45 50 61 70 1.23

Wrought Barrel...70&10@75&5%

Wrought...Bronzed...40&5@50&10%

Wrought Flush, B. K...60&10@60&10%

Wrought Shutter...40&10@10&50&5%

Wrought Square Neck...60&10@10%

Wrought Sun...50&10@10%

Ives' Patent Door...60%

Stove and Plow—
Plow...60&5@65%

Stove...75&5%

Tire—
Common...77½%

Norway Iron...80@80&5%

American Screw Company:
Norway Phila., list Oct. 16, '94...82½%

Eagle Phila., list Oct. 16, '94...85%

Bay State, list Dec. 28, '99...77½%

Franklin Moore Co.:
Norway Phila., list Oct. 16, '94...82½%

Eagle Phila., list Oct. 16, '94...85%

Bellows, list Dec. 28, '99...77½%

Port Chester Bolt & Nut Company:
Empire, list Dec. 28, '99...77½%

Keystone Phila., list Oct. '94...85%

Norway Phila., list Oct. '94...82½%

Upon Nut Co.:
Tire Bolts...77½%

Borers, Tap—

Borers Tap, Ring, with Handle:

Inch...1 1½ 1¾ 2

Per doz...\$1.50 5.00 5.75 7.25

Inch...1½ 2 2½ 3

Per doz...\$3.65 11.50

Enterprise Mfg. Co., No. 1, \$1.35; No. 2, \$1.65; No. 3, \$2.50 each...30%

Boring Machines—See Ma-

chines, Boring.

Boxes, Mitre—
C. K. Jennings & Co...40%

Seavey's, per doz., \$39...40%

Braces—
NOTE—Most Braces are sold at net

prices.

Common Ball, American...\$1.15@1.35

Barber's...80&10&10@80&10%

Fray's Genuine Spotted...60%

Fray's No. 70 to 120, 81 to 125, 207 to 414...60%

C. E. Jennings & Co...80&10%

Mayhew's Hatchet...40%

Mayhew's Quick Action Hay Patent...60%

P. S. & W. Co. Peck's Patent...80&10@85&5%

Brackets—
Wrought Steel...75&5@75

Union Drill.....	30
Universal.....	40
Face Plate Jaws.....	35

See also Chalk.
Creamery Pails—See *Pails*.
Creamery.
Crooks, Shepherds'—
 Fort Madison, Heavy $\$$ doz. \$7.00
 Fort Madison, Light..... $\$$ doz. \$6.50

No. 64, Varnished Handles.....	80&10%
No. 86.....	70&10%
Swan's:	
No. 65 to 68.....	50%
No. 40.....	46&10%
No. 25, 35 and 43.....	20&10&10%

Fuse	200	2000	2000
Hemp Fuse	\$2.60	
Cotton Fuse	3.20	
Single Taped Fuse	3.35	
Double Taped Fuse	4.90	
Triple Taped Fuse	5.00	

Gates, Molasses and Oil—

Marking, Mortise, etc. 55¢ 10¢ 55¢ 10¢ 10¢

Barrett's Comb. Roller Gauge. 50¢ 10¢ 50¢ 10¢ 10¢

Stanley R. & L. Co.'s Butt & Babbet Gauge. 50¢ 10¢ 50¢ 10¢ 10¢

Wire, Brown & Sharpe's. 50¢ 10¢ 50¢ 10¢ 10¢

Wire, Morse's. 50¢ 10¢ 50¢ 10¢ 10¢

Wire P. & S. W. Co. 50¢ 10¢ 50¢ 10¢ 10¢

Glimes—Single Cut

Nail, Metal, Assorted, gro. \$1.50 to \$1.80

Spike, Metal, Assorted, gro. \$2.00 to \$2.25

Nail, Wood Handled, Assorted, gro. \$1.75 to \$2.00

Spike, Wood Handled, Assorted, gro. \$3.25 to \$3.50

Glass, American Window

Jobbers' List, Jan. 21, 1901.

Less than Car Lots from Store. 90%

Carloads from Store. 90¢ to 75¢

Car Lot Consignments, f.o.b. factory. 90¢ to 125¢

Glue—Liquid, Fish—

List A, Bottles or Cans, with Brush. 37½¢ to 60¢

List B, Cans (½ pts., pts., qts.). 35¢ to 55¢

List C, Cans (½ gal., gal.). 35¢ to 45¢

International Glue Co. (Martin's). 40¢ to 55¢

Glue Pots—See Pots, Glue.

Grease, Axle—

Common Grade. 50¢ to \$5.00 to \$6.00

Dixon's Everlasting. 10-lb pails, ea. 55¢

Dixon's Everlasting, in box. 50¢ to 1 lb. \$1.20; 2 lb. \$2.00

Snow Flake.

1 qt. cans, per doz. \$2.00; 2 qt. \$3.20; 3 gal. cans, per doz. \$6.00; 3 gal. \$10.00; 5 gal. \$24.00

Grindstones—

Bicycle Emery Grindstone. 50¢ to 50¢

Bicycle Grindstones, each. \$2.50 to \$3.00

Pike Mfg. Co. Improved Family Grindstones. 50¢ to 50¢

Pike Mower Knife and Tool Grinders, each. \$9.00

Velox Ball Bearings, mounted, Angle Iron Frames. 50¢ to 50¢

Guards Snow—

Cleveland Wire Sp. Ing. Co. Galv. Steel #1000. \$9.00

Copper #1000. \$18.00

Gun Powder—See Powder.

Hack Saws—See Saws.

Hacks Awl—

Peg Patent, Leather Top. \$4.50 to \$5.25

Peg Patent, Plain Top. \$3.50 to \$3.75

Sewing, Brass Ferrule. \$1.50 to \$1.60

Saddlers', Brass Ferrule. \$1.35 to \$1.45

Sad, Common. \$1.25 to \$1.35

Brad, Common. \$1.50 to \$1.75

Halters and Ties—

Covert Mfg. Co. Web. 45¢ to 45¢

Web Rope. 45¢ to 45¢

Sisal Rope. 30¢ to 30¢

Covert's Saddlery Works: Web and Leather Halters. 70¢

Jute and Manila Rope Halters. 70¢

Sisal Rope Halters. 70¢

Jute, Manila and Cotton Rope Hoses. 70¢

Sisal Rope Ties. 60¢ to 60¢

Hammers—

Handled Hammers—

Heller's Machinists. 50¢ to 50¢

Heller's Farriers. 50¢ to 50¢

Magnetite Tack, No. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000

Alkins. 40¢ to 40¢

Champion. 40¢ to 40¢

Dixson's. 50¢ to 50¢

Mechanics' Tool Handles—

Auger, assorted. 50¢ to 50¢

Bradawl. 50¢ to 50¢

Chisel Handles:

Apple Tanged Firmer, gro. ass'd. \$3.25 to \$3.50; large, \$3.50 to \$3.75

Hickory Tanged Firmer, gro. ass'd. \$1.75 to \$2.00; large, \$2.00 to \$2.25

Apple Socket Firmer, gro. ass'd. \$1.70 to \$1.85; large, \$1.85 to \$2.00

Hickory Socket Firmer, gro. ass'd. \$1.60 to \$1.75; large, \$1.75 to \$1.90

Hickory Socket Framing, gro. ass'd. \$2.50 to \$2.75; large, \$2.75 to \$2.90

File, assorted. 50¢ to 50¢

Hammer, Hatchet, Axe, etc. 50¢ to 50¢

Hand Saw, Varnished, doz. 70¢ to 70¢

Not Varnished. 50¢ to 50¢

Plane Handles:

Jack, doz. 50¢; Jack Bolter. 50¢ to 50¢

Fore, doz. 35¢ to 35¢; Fore, Bolter. 70¢ to 70¢

Nicholson Simplicity File Handle. 50¢ to 50¢

Hangers—

Barn Door, New Pattern, Round Groove, Regular: 5 4 5 6 8

Dos. 50¢ 1.50 1.50 1.50 2.50

Barn Door, New England Pattern, Check Back, Regular:

Inch. 5 4 5 6

Dos. 50¢ 1.50 1.75 2.50 3.00

Chicago Spring Butt Co.:

Friction. 25¢

Oscillating. 25¢

Big Twin. 25¢

Chisholm & Moore Mfg. Co.:

Haggage Car Door. 50¢

Elevator. 40¢

Railroad. 55¢

Columbian Hdw. Co.:

American Trackless. 50¢ to 10¢

Cronit Hanger. 50¢

Roller Bearing. 50¢ to 10¢

Lane Bros.:

Parlor Ball Bearing. 40¢

Parlor, Standard. 50¢

Parlor, New Model. 50¢

Parlor, New Champion. 50¢

Barn Door, Standard. 50¢ to 10¢

Covered. 50¢ to 10¢

Special. 50¢ to 10¢

Lawrence Bros.:

Advance. 50¢

Cleveland. 50¢

Crown. 50¢

New York. 50¢

Pe-ress. 50¢ to 10¢

Sterling. 50¢

McKinney Mfg. Co.:

No. 1, Special. 50¢ to 10¢

No. 2, Standard. 50¢ to 10¢

Stowell Mfg. and Foundry Co.:

Acme Parlor Ball Bearing. 40¢

Atlas. 50¢

Badger Barn Door. 50¢

Baggage Car Door. 50¢

Chicago Anti-Friction. 50¢

Elevator. 40¢

Express. 50¢

Interstate. 50¢

Lundy Parlor Door. 50¢

Matchless. 50¢

Na-nen. 50¢ to 10¢

Railroad. 50¢

Street Car Door. 50¢

Steel, Nos. 300, 404, 500. 40¢ to 15¢

Stowell Parlor Door. 50¢

Wild West, Nos. 30, 404, 500. 50¢

Zenith for Wood Track. 50¢

Taylor & Boggs Foundry Co.:

Kidder's. 50¢ to 15¢ to 50¢

Wilcox Mfg. Co.:

Bike Roller Bearing. 50¢ to 10¢

C. J. Roller Bearing. 50¢ to 10¢

Cycle Ball Bearing. 50¢

Dwarf Ball Bearing. 40¢

Ives, Wood Track. 50¢ to 10¢

L. T. Roller Bearing. 50¢ to 10¢

Wilcox Roller Bearing. 50¢ to 10¢

Ladies—Melting—

L. & G. Mfg. Co. 25%
F. S. & W. 5%
Reading 40%
Sargent & Co. 40%

Lanterns—Tubular—

Regular Tubular doz. \$4.75
Side Lift Tubular doz. \$4.75
Square Lift Tubular doz. \$4.75
Other Styles doz. \$4.75

Bull's Eye Police—

No. 1, 2 1/2 inch \$3.00
No. 2, 3 inch \$4.00

Latches, Thumb—

Roggin's Latches doz. \$0.50

Lawn Mowers—

See Mowers, Lawn.

Leaders, Cattle—

Small doz. 50c; large, 55c

Lemon Squeezers—

See Squeezers, Lemon.

Lifters, Transom—

Solid cup, Rayson Mfg. Co. 80%
R. & Co. 45%

Lines—

Wire Clothes, Nos. 18 19 20
100 feet \$2.20 2.00 1.65
75 feet \$1.80 1.70 1.30

Ossawa Mills—

Crown Solid Braided Chalk 33%
Mason's No. 0 to No. 5 33%
Samson Cordage Works 40%
Solid Braided Chalk, No. 0 to 3 40%
Silver Lake Braided Chalk, No. 0, \$6.00;
No. 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50
Per 80%

Locks—Cabinet—

Cabinet Locks 33%
Door Locks, Latches, &c.—
[Net prices are very often made on
these goods.]

Reading Hardware Co. 50%
R. & E. Mfg. Co. 50%
Sargent & Co. 40%

Elevator—

Stowell's 40%

Padlocks—

Wrought Iron 70%
R. & E. Mfg. Co. Wrt. Steel and Brass 50%
Sash, &c.—

Fitch's—

Bronze and Brass 60%
Iron 70%

Ives' Patent—

Bronze and Brass 60%
Iron 65%
Wrought Bronze and Brass 60%
Wrought Steel 60%
Payson's signal 60%
Reading 60%

Machines—Boring—

Common, Upright, Without Augers, \$2.00
Common, Angular, Without Augers, \$2.25

Without Augers.

R. & E. Mfg. Co.: Upright, Angular.
Improved No. 3, \$1.25 No. 1 \$2.00
Improved No. 4, 3.75 No. 2 3.38
Improved No. 5, 2.75
Jennings' 2.50
Millers' Fall 5.75
Snell's, Rice's Pat. 2.50
Swan's, No. 500 5.10 No. 900 5.45

Holisting—

Moore's Anti-Friction Differential Pul-
ley Block 30%
Moore's Hand Hoist, with Lock Brake, 20%
Moore's Portable Pneumatic Hoist, 25%

Ice Cutting—

Chandler's 15%

Washing—

Wayne American doz. \$28.00
Western Star, No. 8 doz. 28.00
Et. Louis, No. 41 doz. 60.00

Mallets—

Hickory 45%
Lignumvitae 45%
Tinner's, Hickory and Applewood,
doz. 60%

Mats—Door—

Elastic steel (W. G. Co.) 10%

Mattocks—

See Picks and Mattocks.

Meat Cutters—

See Cutters, Meat.

Milk Cans—See Cans, Milk**Mills—Coffee—**

Enterprise Mfg. Co. 25%
National, list Jan. 1, '94 30%
Parker's Columbia and Victor 30%

Parker's Box and Side—

Swift, Lane Bros. 30%

Mining Knives—

See Knives, Mining.

Molasses Gates—

See Gates, Molasses.

Money Drawers—

See Drawers, Money.

Mowers, Lawn—

Net prices are generally quoted.

Cheap all sizes, \$1.90 to 1.95
Good all sizes, \$2.25 to 2.50

High Grade 4.25 4.50 4.75 5.00
Continental 6.00 to 10.50
Great American 7.00 to 8.50
Great American Ball Bearing 6.00 to 10.50
Quaker City 7.00 to 8.50
Pennsylvania Golf 6.00 to 10.50
Pennsylvania Horse 7.00 to 8.50
Pennsylvania Pony 6.00 to 10.50
Philadelphia 7.00 to 8.50
Style M. S. C. K. T. 7.00 to 8.50
Style A, all steel 6.00 to 10.50
Style E, Low Wheel 7.00 to 8.50
Style R, High Wheel 7.00 to 8.50
Drexel and Gold Coin, low list 5.00 to 5.50

Nails—

Cut and Wire. See Trade Report.

Wire Nail and Brads, Papered.
List July 30, 1899, 35¢ to 10¢ to 10¢ to 10¢

Hungarian, Finishing, Upholster-

ers, &c. See Tacks.

Horse—

Nos. 6 7 8 9 10
A. C. 25% 25% 25% 25% 25%
Ausable 25% 25% 25% 25% 25%
Capwell, 19¢ 18¢ 17¢ 16¢ 15¢ 10%
C. B. K. 25% 25% 25% 25% 25%
Chaplin's 25¢ 25¢ 25¢ 25¢ 25¢ 40%

Clinto 19¢ 17¢ 16¢ 15¢ 14¢ 40% to 55%

Maud S. 25¢ 25¢ 25¢ 25¢ 25¢ 50%

Neponset, 23¢ 21¢ 20¢ 19¢ 18¢ 40%

Putnam 23¢ 21¢ 20¢ 19¢ 18¢ 38%

Vulcan 23¢ 21¢ 20¢ 19¢ 18¢ 25% to 10%

American, Nos. 5 to 10 10% to 15%

Jobbers' special brands, per lb. 8¢ to 9¢

Picture—

1 1/2 2 2 1/2 3 3 1/2 in.
Brass Head, 45¢ 60¢ 70¢ 95¢ 1.00 gro.
Por. Head, 1.10 1.10 1.10 gro.

Nippers, See Pliers and Nippers.**Nut Crackers—**

See Crackers, Nut.

Nuts—

Cold Punched: Off Hat.
Mfrs. or U. S. Standard.

Square, plain \$5.00 to \$5.10
Hexagon, plain \$5.30 to \$5.40
Square, C. T. & R. \$5.20 to \$5.30
Hexagon, C. T. & R. \$5.80 to \$5.90

Hot Pressed:

Mfrs., U. S. or Nar. Gauge Stand.
Square Blank \$5.30 to \$5.40
Hexagon Blank \$5.80 to \$5.90
Square Tapped \$5.00 to \$5.10
Hexagon Tapped \$5.60 to \$5.70

Oakum—

Best or Government lb. 6 1/4 c
Navy lb. 6 c
U. S. Navy lb. 6 1/4 c
Plumbers' Spun Oakum 6 1/4 c
In carload lots 1/4 lb. off f.o.b. New York.

Oil Axle—

Snowflake 1 pt. cans, per doz. \$3.00
1 qt. cans, per doz. \$4.80
1 gal. cans, per doz. \$15.00
5 gal. cans, per doz. \$66.00

Oil Tanks—See Tanks, Oil.**Oilers—**

Brass and Copper 40¢ to 50¢
Tin or Steel 60¢ to 10¢
Zinc 60¢ to 10¢

Paragon:

Brass and Copper 40¢ to 10¢
Tin or Steel 60¢ to 10¢
Zinc 60¢ to 10¢

Malleable, Hammers Improved, No. 1,
\$3.00; No. 2, \$4.00; No. 3, \$4.40; No. 4, \$5.00
Malleable, Hammers Old Pattern,
same list 50¢ to 10¢
Wilcox & Hobbs Mfg. Co.:
Spring Bottom Cans 70¢ to 10¢
Railroad Oilers etc. 60¢ to 10¢

Oponers—Can—

French doz. 35¢
Iron Handle doz. 25¢
Sprague, Iron Handle, per doz. 35¢ to 40¢
Sardine Scissors doz. \$1.75 to \$3.00
Tip Top doz. \$0.75 to \$1.00
National, per gro. \$1.75 to \$2.00
Stowell's per doz. 35¢ to 45¢
Waldorf, per gro. \$8.00

Egg—

Nickel Plate per doz., \$2.25
Silver Plate per doz., \$3.50

Packing—

Asbestos Packing, Wick and Rope,
15 to 15 1/2 lb.

Rubber—

Sheet, C. I. 8¢ to 10¢
Sheet, C. O. S. 8¢ to 10¢
Sheet, C. B. S. 10¢ to 12¢
Sheet, Pure Gum 50¢ to 70¢
Shet. Red 30¢ to 40¢
Jenkins' Standard, per 50 lb. \$25.00 to \$28.00

Miscellaneous—

American Packing 70¢ to 10¢ lb.
Cotton Packing 15¢ to 10¢ lb.
Italian Packing 90¢ to 15¢ lb.
Jute 30¢ to 40¢ lb.
Russia Packing 70¢ to 10¢ lb.

Pails—Creamery

S. S. & Co. with gauges, No. 1 \$0.50;
No. 2, \$0.75 per doz.

Galvanized—

Price per gro.

Quart. 10 12 14
Water, Regular 18.00 21.00 24.00
Water, Heavy 24.00 27.00 30.00
Fire, Rd. Bottom 31.00 33.00 35.00
Well 27.00 29.00 31.00

Pans—Dripping—

Standard List 50¢ to 10¢ to 50¢ to 10¢

Fry—

Common Lipped:

No. 1 2 3 4 5
Per doz. \$0.60 .75 .85 .95 1.15

Roasting and Baking—

Regal, S. S. & Co., per doz. Nos. 5, \$1.50;
10 \$5.00; 20 \$5.50; 30 \$6.00
Simplex, per gro. No. 40 \$30.00; 50,
\$34.50; 60 \$39.00; 140, \$33.00; 150,
\$37.50; 180, \$43.00.

Paper—Building Paper—

Asbestos:

Building Felt lb.
Mill Board, sheet, 40 x 40 inches 40¢
Mill Board, roll, thicker than 1-16
inch 30¢
Mill Board, roll, 1-16 in. thick and
less 30¢

Rosin Sized Sheathing:

Light wt., 50 lbs. to roll \$1.75
Medium wt., 50 lbs. to roll \$2.00
Heavy wt., 50 lbs. to roll \$2.25
Medium Grades Water Proof
Sheathing \$0.65 to \$1.25
Deafening Felt, 2, 3 and 4 1/2 sq. ft.,
to lb., ton \$40.00 to \$2.00

Red Rope Roofing, 250 sq. feet per

roll \$1.65

Tarred Paper.

1 ply (roll 500 sq. ft.), ton \$58.00 to \$60.00
2 ply, roll 108 sq. ft. 40¢ to 45¢
3 ply, roll 108 sq. ft. 80¢ to 85¢
Slater's Felt (roll 500 sq. ft.), 60¢ to 65¢
R. R. M. Stone Surfaced roofing (roll
110 sq. ft.) \$2.75

Sand and Emery—

List Dec. 23, 1899, 50¢ to 10¢ to 10¢ to 10¢

Parers—Apple—

Advance doz. \$4.50
Baldwin doz. \$5.00
Bouanza each \$5.00
Dandy each \$7.50
Eureka, 1898 each \$10.00
Family Bay State doz. \$12.00
Hudson doz. \$4.00
Hudson's Rocking Table doz. \$5.50
Improved Bay State per doz. \$37.00 to \$30.00
New Lightning doz. \$5.50
Reading 73 doz. \$4.00
Reading 78 doz. \$7.00
Turn Table 98 doz. \$5.50
White Mountain doz. \$4.00

Potato—

Saratoga doz. \$5.50
White Mountain doz. \$4.50

Picks and Mattocks—

List Feb. 23, 1899, 70¢ to 70¢ to 10%

Pigeons—Clay

Markle's Black Birds, f.o.b. factory,
per M \$5.75
See also Traps, Target.

Pinking Irons—

See Irons, Pinking.

Pine—Escutcheon—

Brass 60%
Iron, list Nov. 11, '85, 60%

Pipe, Cast Iron Soil—

Standard, 2-6 in. 60¢ to 7 1/2%
Extra Heavy, 2-6 in. 70%
Fittings 75¢ to 5%

Pipe, Merchant, Boiler

Tubes, &c.—

Less than Carloads to Consumers.

Merchant Pipe.

Black, nized

1/4 to 1/2 inch 61% 48%
3/4 to 1 inch 63% 56%
Boiler Tubes Up to 2 1/2 feet

Steel.

1 to 1 1/2 inch and 3/4 to 5 inch in-
clusive 65%
2 to 2 1/2 inch, inclusive 60%
6 to 10 inches 69%

1 to 1 1/2 inch and 7/8 in. 63%
1 1/2 to 2 inch 65%
2 1/2 to 3 inch 65%
3 1/2 to 4 inch 65%
4 to 5 inch 61%
5 to 6 inch 61%
Note.—Prices are largely nominal owing
to scarcity of Pipe. Jobbers are ob-
taining almost any price they ask.

Pipe, Sewer—

Standard Pipe and Fittings, 2 to 2 1/2 in.

New England 70%
New York and New Jersey 75%
Ohio and Michigan 75%
Carload lots are generally deliv-
ered.

Planes and Plane Irons—

Wood Planes—

Molding 40¢ to 10¢ to 10%
Bench, First quality 45¢ to 10¢ to 10%
Bench, Second quality 60¢ to 10¢ to 10%
Bailey's (Stanley R. & L. Co.)
50¢ to 10¢ to 10% to 10%
Gage Self Setting 85%
Bailey's (Stanley R. & L. Co.)
50¢ to 10¢ to 10% to 10%
Chaplin's Iron Planes 50¢ to 10%
Miscellaneous Planes (Stanley R. & L.
Co.) 25¢ to 10¢ to 10% to 10%
Sargent's 50¢ to 10% to 10%

Plane Irons—

Wood Bench Plane Irons—

Buck Bros. 30%
Stanley R. & L. Co. 50¢ to 10¢ to 10%
L. J. White 20¢ to 25%

Planters, Corn, Hand.

Kohler's Eclipse doz. \$9.00

Plates—

Felco lb. 3 1/4 to 4¢
Self-Sealing Pie Plates (S. S. & Co.),
doz. \$2.00 50%

Pliers and Nippers—

Button Pliers 70¢ to 10¢ to 75%
Gas Burner, per doz., 5 in., \$1.15 to
\$1.20; 6 in., \$1.35 to \$1.45
Gas Pipe 1 1/2 2 2 1/2 3 3 1/2 4 5 6 7 8 10 12 in.
Bernard's 50¢ to 50¢ to 55%

Parallel Pliers, &c. 45%
Paragon Pliers 50¢ to 55%
Lodi Pliers 50¢ to 55%
Elm City Forge Pliers 35%
Crown Hanger Co. 75¢ to 10%
Cronk's 60%
Improved Button 70¢ to 10%
Stub's Pattern 50%
Combination and others 25%
Heller's Barriers and Tools 50¢ to 50%
P. S. & W. Tinner's Cutting Nippers
30¢ to 30¢ to 10%

Swedish Slide, End and Diagonal Cut-

ting Pliers 50%

Utica Drop Forge & Tool Co.,
Pliers and Nippers, all kinds 40%

Plumbs and Levels—

Plumbs and Levels 75¢ to 75¢ to 10%

Davis Iron, Machinist Nos. 1 to 14 90%
Davis Iron, Adjustable Nos. 6 to 49 85%
Diaston's 70%
Pocket Levels 70¢ to 10¢ to 10% to 10%
Stanley R. & L. Co. 70¢ to 10¢ to 10% to 10%
Woods' Extension 33%

Poachers, Egg—

Buffalo Steam Egg Poachers, per doz.,
No. 1, \$7.20; No. 2, \$11.00 No. 3,
\$11.00; No. 4, \$14.50 50%

Points, Glaziers—

Bulk and 1 lb. papers, lb. 8 c to
1/2 lb. papers lb. 8 1/2 c to
3/4 lb. papers lb. 9 c to

Pokes, Animal—

St. Madison Hawkeye doz. \$3.25
St. Madison, Western doz. \$3.75

Police Coats—

Manufacturers' Lists 25¢ to 25¢ to 25%

Polish—Metal—

Prestoline Liquid, No. 1 (1/2 pt.), doz.
\$3.00; No. 2 (1 qt.), \$9.72 40%
Prestoline Paste 40¢ to 10%
George

Nail—

Square,.....	per gro.	\$2 50
Round, B'k. and Poi.	do.	assorted.....
	gro.	\$1.80 to \$4.75

Octagon.....do. \$4.25 to \$4.75
Knurled, Good.....gro. \$5.00 to \$5.75
Buck Brothers.....do. 27 1/2
Cannon's Diamond Point, W. gr. \$12. 25
Mayhew's.....per gro. \$8.00
Snell's Corruated, Cup Pt. per gro. \$7.50
Snell's Knurled, Cup Pt. per gro. \$7.50

Rivet—

Regular list.....	70¢	70¢	10¢
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Saw—

Alken's:
Genuine.....\$ doz. \$5.50 to \$6.00
Imitation.....\$ doz. \$3.00 to \$3.12

Atkin's:
Criterion.....101
Adjustable.....402
Bemis & Call Co's.....304
Cross Cut.....304
Hammer, new Pat.....401
Plate.....3
Spring Hammer.....401
Dietson's Star and Monarch.....354
Morrill's No. 1, \$15.00.....402 to 41
No. 3 and 4, Cro. Cut.....50¢ to 20¢
No. 5, Mill, \$31.00.....50¢ to 30¢
No. 10, \$15.50.....402 to 41
No. 11, \$16.00.....402 to 41
Taintor Positive, \$ doz. \$18.....401

Sharpeners Knife—

Chicago Wheel & Mfg. Co.....	65¢
Smith & Hemenway Co.....	70 to 51
Tanite Mills \$ gross, \$14.40.....	35 to 39 1/4

Sharpeners Skate—

Eureka Skate Sharpener.....	\$ doz. \$2.00
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Shaves, Spoke—

Iron.....	do.	\$1 00 to 1 1/2
Wood.....	do.	\$1.75 to 3 1/2
Bailey's (Stanley R. & L. Co.).....	50¢ to 104	
Goodell's.....	\$ doz. \$6.00.....	15¢ to 104

Shears—

Cast Iron.....	7	8	9 in.
Best.....	\$16.00	18.00	50.00 gro.
Good.....	\$13.00	15.00	17.00 gro.
Cheap.....	\$5.00	6.00	7.00 gro.

Straight Trimmers, etc.:
Best quality, Jap.....70¢ to 70¢ to 104
Nickel.....60 to 60¢ to 104
Fair qual. Jap.....80 to 80¢ to 54
Nickel.....75 to 75¢ to 104

Tailors' Shears.....400 to 402 to 104
Acme Cast Shear.....400 to 402 to 104
Heinrich's Tailors' Shears.....404
Wilkinson's Hedge.....404
Wilkinson's Sheep.....1900 list, 504

Timners' Snips—

Steel Blades.....	20¢ to 104
Steel Laid Blades.....	40¢ to 104
Forged Handles, Steel Blades, Berlin.....	40 to 104 to 104
Jennings & Griffin Mfg. Co's. 7 to 10 to 104.....	504
Inch.....	504
Nature Safe.....	404
P. S. & W. Co.....	404

Pruning Shears and Tools—

Cronk's Grape Shears.....	33 1/2
Cronk's Pruning Shears.....	33 1/2
Disston's Combined Pruning Hook and Saw, \$ doz. \$18.00.....	25 to 25 1/2 to 104
Disston's Pruning Hook.....	\$ doz. \$2.00
John T. Henry Mfg. Company.....	25 to 25 1/2 to 104
Pruning Shears, all grades.....	40 to 40 to 54
Orange Shears.....	50 to 104 to 50 to 204
Grape.....	40 to 104 to 504
Tree Pruners.....	75¢
Nagle's Pruning Shears.....	10 to 54
P. S. & W. Co.....	33 1/2

Sheaves—Sliding Door—

Stowell's Anti-Friction.....	50¢
Patent Roller Hatfield's, Sargent's list.....	75 to 104 to 104
Reading.....	70 to 104 to 754
R. & E. list.....	83 1/2
Wrightsville, Hatfield Pattern.....	80¢

Sliding Shutter—

Reading list.....	70 to 104 to 754
R. & E. list.....	83 1/2
Sargent's list.....	50 to 104 to 104

Shells— Shells, Empty—

Bras: She Is, Empty:	
First quality, all grades.....	60 to 54
Climax, Club, Rival, 10, 12 and 12 gauge.....	55 to 54

Paper Shells, Empty:
Acme, Ideal, Leader, New Rapid, 8 nokeless 10, 12, 16 and 20 gauge.....83 1/2 to 104
Blue Rival, New Climax, Primrose, Club, Yellow Rival, 10, 12, 16 and 20 gauge.....154
Climax Club, League, Rival, 14, 16 and 20 gauge (\$7.50 list).....20 to 54
Climax Club, League, Rival, 10 and 12 gauge.....25 to 54
Dodge, High Basises, New Victor, Nitro, Repeater, 10, 12, 16 and 20 gauge.....154
Trap and Metal Lined, 10, 12, 16 and 20 gauge.....83 1/2 to 104 to 54

Shells, Loaded—

Loaded with Black Powder.....	40 to 54
Loaded with Smokeless Powder, medium grade.....	40 to 104 to 54
Loaded with Smokeless Powder, high grade.....	50 to 104 to 104 to 54

Shoes, Horse, Mule, &c.—

F. o. b., Pittsburg:	
Iron.....	per keg \$3.50
Steel.....	per keg 3.25
Burien's, all sizes, 9 keg.....	\$3.60

Shot—

Drop, up to B, 25-lb. bag.....	\$1.55
Drop, B and larger, per 25-lb. bag.....	\$1.00
Buck, 25-lb. bag.....	\$1.10
Chilled, 25 lb. bag.....	\$1.60
Just shot, 25-lb. bag.....	\$2.10
Marble's Chilled.....	\$1.00
Ravmon's Cl. list.....	\$1.00

Shovels and Spades—

Association list.....	40¢
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Note—Common Plain Back Shovels are generally sold by jobbers at \$5.75 to \$7.00.

Sieves and Sifters—
 Hunter's Imitation, gro. \$11.00 to \$15.50
 Buffalo Metallic Blued, S. S. & Co., gr.:
 14x16 10x18 18x20
 \$12.90 \$13.80 \$15.00
 F. J. Meyers Mfg. Co.:
 Bolts, gr. \$11.00
 Electric Light, gr. \$11.00
 Hunter's Genuine, gr. \$12.50
 No Name, Hunter's, gr. \$11.00
 Standard, gr. \$11.00
 Shaker (Harler's Pat.) Flour Sifters,
 \$20.00 \$23.00 \$30.00

Sieves, Tin Rim—
 Per dozen
 Mesh 10 16 18 20
 Black full size \$0.95 \$1.00 \$1.10
 Plated, full size \$1.05 \$1.10 \$1.20
 Black, scant \$0.78 .80 .85

Sieves, Wooden Rim—
 Nested, 10, 11 and 12 inch.
 Mesh 18, Nested, doz. \$0.55 to \$0.75
 Mesh 20, Nested, doz. \$0.70 to .85
 Mesh 24, Nested, doz. \$0.90 to \$1.00

Sinks—Cast Iron—
 Standard list \$6.50 to \$10.00
 Note: There is not entire uniformity
 lists used by jobbers
Wrought Steel—
 New Era, Galv'd and Enamelled, 70x55
 New Era, Painted, 60x40
 L. & G. Mfg. Co., Galvanized, 50x35
 L. & G. Mfg. Co., Enamelled, 50x35

Sinks, Wagon—
 Cast Iron, 70x40 to 75x40
 Malleable iron, 100x10 to 105x10
 Steel, 100x10 to 105x10

Slates—
 Factory Shipments.
 "D" Slates, 60x10 to 65x10
 Unexcelled, etc., Noiseless Slates, 60
 & 8 tens %
 Victoria, etc., Noiseless Slates, 60x40
 7 tens %
 Wire Bound, 50x10 to 55x10
 Web Hinge, 50x10 to 55x10

Slaw Cutters—See Cutters.
Slicers, Vegetable—
 Sterling \$2.00 to \$3.34
Snaps, Harness—
 German, 40x10 to 45x10
 Covert Mfg. Co., 35x25
 Jockey, 45x25
 Trojan, 45x25
 Yankee, 35x25
 Yankee, Roller, 35x25

Covert's Saddlery Works:
 Crown, 60x40
 German, 60x40
 Mole, 60x40
 Triumph, 60x40

W. & L. T. Mich. Co.:
 Bristol, 40x10
 Hampshire, 50x35
 German, 45x25
 National, 50x35
 Perfect, 45x25
 Clipper, 50x35
 Champion, 40x10
 Security, 40x10
 Victor, 60x35
 Onella, 60x35

Snaths—
 Scythe, 50x10 to 55x10
Snips, Tinners—See Shears
Soldering Irons—
 See Irons, Soldering.
Spoke Trimmers—
 See Trimmers, Spoke.
Spoons and Forks—
Silver Plated—
 Good Quality, 50x10 to 60x10
 Cheap, 60x10 to 65x10
 International Silver Co.:
 1847 Rogers Bros. and Rogers & Hamilton,
 Rogers & Bros., William Rogers Eagle
 Brand, 50x10 to 55x10
 Anchor, Rogers Brand, 60x10
 Wm. Rogers & Son, 60x10
 Simeon L. & Geo. A. Rogers Co.:
 Silver Plated Flat Ware, 60x10
 No. 17 Silver Plated Ware, 60x10

Miscellaneous—
 German Silver, 60x10 to 65x10
 Simeon L. & Geo. A. Rogers Co.:
 German or Nickel Silver, Special list
 1 & 10x

Tinned Iron—
 Teas, per gro. 45 to 50c
 Tables, per gro. 90c to \$1.00

Springs—Door—
 Gem (Coil), 20x
 Star (Coil), 30x
 Torrey's Rod, 30 in., \$1.10 to \$1.25
 Victor (Coil), 50x10 to 55x10

Carriage, Wagon, &c.
 1 1/2 in. and wider:
 Black or 1/4 Bright, lb. 4x10
 Bright, lb. 6x10
 Painted Seat Springs:
 1 1/2 x 22 x 26 and smaller, per pr. 1.50 to 1.75
 1 1/2 x 22 x 28 per pr. 1.75 to 2.00
 1 1/2 x 22 x 28 and narrower, per pr. 2.00 to 2.25

Cliff's Springs:
 Bolster, 40x
 Seat, 40x
 Pole, per pair, 1/4 in. \$1.10; 1/2 in. \$1.25

Sprinklers, Lawn—
 Enterprise, 25x20
 Philadelphia No. 1, \$1.00; No. 2,
 \$1.25; No. 3, \$1.50

Squares—
 Nickel plated, List Jan. 5, 1901
 Steel and Iron, 70x10 to 75x10
 Rosewood Hdl Try Square and T-
 Bevels, 60x10 to 65x10

Iron Hdl. Try Squares and T-Bevels.
 Diston's Try Sq. and T-Bevels, 60x10 to 65x10
 Winterbottom's Try and Miter, 60x10 to 65x10

Squeezers—
Lemon—
 Wood, Common, gro., No. 0, \$5.25
 \$5.60; No. 1, \$6.25 to \$6.50.
 Wood, Porcelain Lined:
 Cheap, doz. \$2.00 to \$2.75
 Good Grade, doz. \$3.00 to \$3.50
 Tinned Iron, doz. \$0.75 to \$1.25
 Iron, Porcelain Lined doz. \$2.90 to \$3.25
 Jennings' Star, doz. \$1.85 to \$1.90

Staples—
 Barbed Blind, lb. 60x10
 Electricians', Association list, 80x10 to 100x10
 Fence Staples, same price as Barbed
 Wire. See Trade Report.
 Poultry Netting, Staples, per lb. 24x10

Grand Crossing Tack Co.'s list, 80x10 to 100x10
Steels, Butchers—
 Dick's, 30x
 Foster Bros., 30x
 Hartzell Cutlery Co., 30x
 C. & A. Hoffmann's, 30x

Steelyards, 35x25 to 40x25
Stocks and Dies—
 Blacksmiths', 10x10 to 10x10
 Gardner Die Stocks, larger sizes, 40x
 Green River, 25x
 Lightning Screw Plate, 25x
 Little Giant, 25x
 Ray's New Sengs Plates, 25x30
 Curtis Reversible Ratchet Die Stock, 25x30

Stone—
Scythe Stones—
 Chicago Wheel & Mfg. Co.:
 Gem Corundum, 10 inch, \$3.00 per
 gro., 12 inch, \$10.00
 Pike Mfg. Co. 1901 list:
 Black Diamond S. S., gr. \$12.00
 Lamolite S. S., gr. \$11.00
 White Mountain S. S., gr. \$9.00
 Green Mountain S. S., gr. \$8.00
 extra Indian Pond S. S., gr. \$7.50
 No. 1 Indian Pond S. S., gr. \$7.00
 No. 2 Indian Pond S. S., gr. \$6.50
 Leader Red End S. S., gr. \$4.50
 Balance of list 38x45

Oil Stones, &c.
 Chicago Wheel & Mfg. Co. 1901 list:
 Gem Corundum Oil, Double Grit, 50x
 Gem Corundum Oil, Single or Double
 Grit, 50x
 Gem Corundum Slips, 50x
 Gem Corundum Razor Hones, 50x
 Pike Mfg. Co. 1901 list:
 Arkansas Stone, No. 1, 8 to 5 in., \$3.50
 Arkansas Stone, No. 1, 5 to 3 in., \$4.50
 Ark. 3 to 1 in. \$1.00
 Lily White Washita 4 to 8 in. \$4.00
 Washita Stone, Extra, 4 to 8 in., \$5.00
 Washita Stone, No. 1, 4 to 8 in., \$4.00
 Lily White Slips, 4 to 8 in., \$3.00
 Rosy Red Slips, 4 to 8 in., \$3.00
 Washita Slips, Extra, 50x
 Washita Slips, No. 1, 70x
 India Oil Stones (entire list) 25x

Hindustan No. 1, Regular, \$1.00; \$1.25; \$1.50; \$2.00; \$2.50; \$3.00; \$3.50; \$4.00; \$4.50; \$5.00; \$5.50; \$6.00; \$6.50; \$7.00; \$7.50; \$8.00; \$8.50; \$9.00; \$9.50; \$10.00; \$10.50; \$11.00; \$11.50; \$12.00; \$12.50; \$13.00; \$13.50; \$14.00; \$14.50; \$15.00; \$15.50; \$16.00; \$16.50; \$17.00; \$17.50; \$18.00; \$18.50; \$19.00; \$19.50; \$20.00; \$20.50; \$21.00; \$21.50; \$22.00; \$22.50; \$23.00; \$23.50; \$24.00; \$24.50; \$25.00; \$25.50; \$26.00; \$26.50; \$27.00; \$27.50; \$28.00; \$28.50; \$29.00; \$29.50; \$30.00; \$30.50; \$31.00; \$31.50; \$32.00; \$32.50; \$33.00; \$33.50; \$34.00; \$34.50; \$35.00; \$35.50; \$36.00; \$36.50; \$37.00; \$37.50; \$38.00; \$38.50; \$39.00; \$39.50; \$40.00; \$40.50; \$41.00; \$41.50; \$42.00; \$42.50; \$43.00; \$43.50; \$44.00; \$44.50; \$45.00; \$45.50; \$46.00; \$46.50; \$47.00; \$47.50; \$48.00; \$48.50; \$49.00; \$49.50; \$50.00; \$50.50; \$51.00; \$51.50; \$52.00; \$52.50; \$53.00; \$53.50; \$54.00; \$54.50; \$55.00; \$55.50; 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Brass Surface:	
Brass King, Single Surface, open back	\$.00
Nickel Plate Surface:	
No. 1001 Nickel Plate, Single Surface	\$.00
Washers—	
Leather, Axle—	
Solid.....85¢ 10¢ 10¢ 10¢ 10¢ 10¢	
Patent.....85¢ 10¢ 10¢ 10¢ 10¢ 10¢	
Coil: 1/2 1 1 1/2 1 3/4 Inch.	
10c 11c 12c 13c per 100	
Iron or Steel	
Size bolt...5-16 3/8 1/2 5/8 3/4	
Washers.....85¢ 10¢ 10¢ 10¢ 10¢ 10¢	
In lots less than one keg add 1/4c per lb., 5-lb. boxes add 1/4c to list.	
Cast Washers—	
Over 1/2 inch. barrel lots. per lb.....	1 1/2¢ 1 3/4c
Washer Cutters—	
See Cutters, Washer.	
Washing Machines—	
See Machines, Washing.	
Water Coolers—	
See Coolers, Water.	
Wedges—	
Oil Finish.....lb. 2.90@3.10c	
Weights, Sash	
Per ton, f.o.b. factory.....\$1.00@2.00	

Some Foundries make price \$1@2 lower.	
Well Buckets, Galvanized	
See Pails, Galvanized.	
Wheels Well—	
8-in. \$1.45@1.65; 10-in. \$1.75@2.00;	
12-in. \$2.35@2.50; 14-in. \$3.50@3.75	
Wire and Wire Goods—	
Bright and Annealed:	
6 to 9.....72 1/2¢ 75¢ 77 1/2¢ 10¢	
10 to 18.....72 1/2¢ 75¢ 77 1/2¢ 10¢	
19 to 26.....75¢ 77 1/2¢ 79¢ 10¢ 11 1/2¢	
27 to 36.....75¢ 77 1/2¢ 79¢ 10¢ 11 1/2¢	
Galvanized:	
6 to 18.....70¢ 72 1/2¢ 75¢ 10¢	
19 to 26.....72 1/2¢ 75¢ 77 1/2¢ 10¢	
27 to 36.....72 1/2¢ 75¢ 77 1/2¢ 10¢	
Coppered:	
6 to 9.....70¢ 72 1/2¢ 75¢ 10¢	
10 to 18.....70¢ 72 1/2¢ 75¢ 10¢	
19 to 26.....75¢ 77 1/2¢ 79¢ 10¢ 11 1/2¢	
27 to 36.....75¢ 77 1/2¢ 79¢ 10¢ 11 1/2¢	
Tinned:	
6 to 18.....70¢ 72 1/2¢ 75¢ 10¢	
19 to 26.....72 1/2¢ 75¢ 77 1/2¢ 10¢	
27 to 36.....70¢ 72 1/2¢ 75¢ 10¢	
Annealed Wire on Spools.....70¢ 72 1/2¢ 75¢ 10¢	

Brass and Copper Wire on Spools.....	60¢ 5¢ 50¢ 10¢
Brass, list Feb. 26, '96.....	85¢
Copper, list Feb. 26, '96.....	15¢
Cast Steel Wire.....	60¢
Stubs' Steel Wire.....	\$5.00 to \$2.40¢
Wire Picture Cord, see Cord.	
Bright Wire Goods—	
List April 1, 1901.....	85¢ 10¢
Wire Cloth and Netting—	
Galvanized Wire Netting.....	3¢ 20¢
Painted Screen Cloth per 100 ft.....	\$1.00
Light Hardware Grade:	
2-13 Mesh, Plain (Sc. list) 27 ft.....	1 1/2¢ 1 3/4c
2-18 Mesh, Galv. (Sc. list) 27 ft.....	2 1/4¢ 2 1/2c
Wire, Barb—See Trade Report.	
Wire Rope—See Rope, Wire.	
Wrenches—	
Agricultural.....	70¢ 10¢ 75¢ 10¢
Case lots.....	75¢ 10¢
Acme.....	80¢ 10¢
Aligator.....	70¢
Baxter's S.....	60¢ 10¢
Ball Dog.....	70¢
Bent's & Co's.....	35¢ 5¢
Adjustable S Pids.....	30¢ 10¢
Bridge's Pattern.....	40¢ 5¢
Combination Black.....	40¢ 5¢

Combination Bright.....	40¢
Cylinder or Gas Pipe.....	55¢
Extra Heavy.....	45¢
Merrick's Fastern.....	50¢
No. 3 Pipe, Bright.....	55¢
Bindley Automatic.....	30¢
Boardman's.....	39¢
Coe's (Genuine).....	40¢ 10¢ 5¢ 5¢
Coe's "Mechanics".....	40¢ 10¢ 5¢ 5¢
Donohue's Engineer.....	40¢ 10¢
Eagle.....	50¢ 10¢
Elgin Wrenches.....	40¢
Elgin Monkey Wrench Pipe Jaws.....	30¢
Gem Pocket.....	30¢
Hercules.....	70¢
Knife Handle, Machinists' (W. & R.).....	50¢ 10¢
Less than case lots.....	50¢ 5¢
Improved Pipe (W. & R.).....	50¢
Solid Handle, P.S. & W.....	50¢ 50¢ 10¢
Staples.....	60¢ 10¢
Triumph.....	60¢ 10¢
Wrought Goods—	
Staples, Hooks, etc., list March 17 '92.....	90¢ 10¢ 10¢
Yokes Neck—	
Covert Saddlery Works, Trimmed.....	1.00 5¢
Covert Saddlery Works, Neck Yoke.....	70¢
Yokes, Ox, and Ox Bows—	
Fort Madison's Farmers & Freighters.....	list net
Zinc—	
Sheet.....	lb 6 1/4¢ @ 6 1/2c

PAINTS, OILS AND COLORS—Wholesale Prices.

White Lead, Zinc, &c.	
Lead, English white, in Oil.....	94¢
Lead, American white, in Oil:	
Lots of 500 lb or over.....	6 1/2¢
Lots less than 500 lb.....	7¢
Lead, White, in oil, 25 lb tin	
pails, add to keg price.....	1/4¢
Lead, White, in oil, 19 1/4 lb tin	
pails, add to keg price.....	1¢
Lead, White, in oil, 1 to 5 lb as	
sorted tins, add to keg price.....	1 1/4¢
Lead White, Dry in bbls.....	5 1/4¢ 6¢
Lead, American, Terms: On lots of 500	
lbs. and over, 60 days, or 25 for cash if	
paid in 15 days from date of invoice.	
Zinc, American, dry.....	4 1/2¢ 4 3/4c
Zinc, Paris, Red Seal, dry.....	8 1/2¢
Zinc, Paris, Green Seal, dry.....	9 1/2¢
Zinc, Antwerp Red Seal, dry.....	6 1/2¢
Zinc, Antwerp, Green Seal, dry.....	8¢
Zinc, V. M. French, in Poppy Oil,	
Green Seal:	
Lots of 1 ton and over.....	12¢ 12 1/2c
Lots of less than 1 ton.....	12 1/2¢ 12 3/4c
Zinc, V. M. French, in Poppy Oil,	
Red Seal:	
Lots of 1 ton and over.....	10 1/2¢ 11 1/4c
Lots of less than 1 ton.....	11¢ 11 1/2c
Discounts—V. M. French Zinc—Dis-	
counts to buyers of 10 bbl. lots of one or	
assorted grades, 15; 25 bbls., 25; 50	
bbls., 42.	
Dry Colors.	
Black, Carbon.....	9¢ 30¢
Black, Drop, Amer.....	4¢ 7¢
Black, Drop, Eng.....	7¢ 11¢
Black, Ivory.....	12¢ 21¢
Lamp, Com.....	4 1/2¢ 6¢
Blue, Celestial.....	3¢ 4¢ 6¢
Blue, Chinese.....	30¢ 35¢
Blue, Prussian.....	28¢ 34¢
Blue, Ultramarine.....	4¢ 20¢
Brown, Spanish.....	1 1/2¢ 1¢
Brown, Vandyke, Amer.....	1 1/2¢ 2 1/4c
Brown, Vandyke, Foreign.....	2 1/4¢ 3 1/4c
Carmine, No. 40.....	2¢ 2 1/2c 2 1/2c
Green, Chrome, ordinary.....	5¢ 6 1/4c

Green, Chrome, pure.....	16¢ 33¢
Lead, Red, bbls. 1/2 bbls. and kegs:	
Lots 500 lb or over.....	6¢
Lots less than 500 lb.....	6 1/2¢
Litharge, bbls. 1/2 bbls. and kegs:	
Lots 500 lb or over.....	6¢
Lots less than 500 lb.....	6 1/2¢
Ocher, French Washed.....	1 1/2¢ 1 1/4c
Ocher, Dutch Washed.....	4 1/2¢ 5¢
Ocher, American.....	10¢ 10 1/2c 15¢
Orange Mineral, English.....	8¢ 8 1/2c 11 1/4c
Orange Mineral, French.....	11 1/2¢ 11 1/4c
Orange Mineral, German.....	8¢ 8 1/2c
Orange Mineral, American.....	8¢ 8 1/2c
Red, Indian, English.....	4 1/2¢ 5¢
Red, Indian, American.....	3¢ 3 1/2c
Red, Turkey, English.....	4¢ 4 1/2c
Red, Turkey, American.....	7¢ 10¢
Red, Tuscan, English.....	7¢ 10¢
Red, Venetian, Amer. #100 lb.....	80¢ 1.75
Red, Venetian, English #100 lb.....	1.50 3.00
Sienna, Italian, Burnt and	
Powdered.....	3 1/2¢ 3 1/4c
Sienna, Ital., Raw, Powd.....	3 1/2¢ 3 1/4c
Sienna, American, Raw.....	1 1/2¢ 2¢
Sienna, American, Burnt and	
Powdered.....	1 1/2¢ 2¢
Talc, French.....	100¢ \$1.25 @ 1.50
Talc, American.....	90¢ @ 1.10
Terra Alba, French, #100 lb.....	95¢ @ 1.00
Terra Alba, English.....	95¢ @ 1.00
Terra Alba, American No. 1.....	95¢ @ 1.00
Terra Alba, American No. 2.....	95¢ @ 1.00
Umber, Turkey, Bnt. & Powd.....	2 1/2¢ 3 1/4c
Umber, Turkey, Raw & Powd.....	2 1/2¢ 3 1/4c
Umber, Bnt. Amer.....	1 1/2¢ 2¢
Umber, Raw, Amer.....	1 1/2¢ 2¢
Yellow, Chrome.....	10¢ 12 1/2c
Vermilion, American Lead.....	10¢ 12 1/2c
Vermilion, Quicksilver, bulk.....	30¢ 37¢
Vermilion, Quicksilver, bags.....	30¢ 37¢
Vermilion, English, Import.....	30¢ 37¢
Vermilion, Chinese.....	\$1.05 @ 1.20
Colors in Oil.	
Black, Lampblack.....	12¢ 14¢
Blue, Chinese.....	36¢ 40¢
Blue, Prussian.....	32¢ 35¢
Blue, Ultramarine.....	13¢ 16¢

Brown, Vandyke.....	9 1/2¢ 13¢
Green, Chrome.....	10¢ 12 1/2c
Green, Paris.....	10¢ 12 1/2c
Sienna, Raw.....	10¢ 12 1/2c
Sienna, Burnt.....	10¢ 12 1/2c
Umber, Raw.....	9 1/2¢ 12 1/2c
Umber, Burnt.....	9 1/2¢ 12 1/2c
Miscellaneous.	
Barytes, Foreign, #1 ton.....	\$19.00 @ 21.00
Barytes, Amer. floated.....	19.00 @ 20.00
Barytes, Crude, No. 1.....	9.00 @ 10.00
Chalk, in bulk.....	2.50 @ 2.60
China Clay, English.....	100¢ @ 35¢
China Clay, English.....	12.00 @ 17.50
Cobalt, Oxide.....	\$100 @ 2.25 @ 2.50
Whiting, Common.....	100¢ @ 40¢
Whiting, Gliders.....	45¢ @ 55¢
Whiting, extra Gliders.....	55¢ @ 58¢
Putty.	
In bladders.....	\$2.25
In bulk.....	1.25
In cans 1 lb to 1 1/2 lb.....	3.25
In cans 1 1/2 lb to 2 1/2 lb.....	2.25
Spirits Turpentine.	
In Southern bbls.....	37¢ 49¢ 4¢
In machine bbls.....	38¢ 48¢ 4¢
Glue.	
Cabinet.....	11 1/4¢ 16¢
Extra White.....	18¢ 23¢
French.....	12¢ 14¢
Irish.....	13¢ 16¢
Low Grade.....	9¢ 12¢
Medium White.....	14¢ 16¢
Animal, Fish and Veget-	
table Oils.	
Linseed, City, raw.....	7 gal. 53¢ @ 56¢

Linseed, City, boiled.....	38¢ 58¢
Linseed, State and West'n, raw.....	51¢ 54¢
Linseed, raw Calcutta see.....	55¢
Lard, Prime.....	50¢ 51¢
Lard, No. 1.....	51¢ 55¢
Lard, No. 2.....	47¢ 48¢
Cotton-seed, Crude.....	40¢
Cotton-seed, Summer Yellow,	
prime.....	41¢ 41 1/2c
Cotton-seed Summer Yellow,	
off grades.....	40¢ 40 1/2c
Sperm, Crude.....	60¢ 61¢
Sperm, Natural Spring.....	60¢ 61¢
Sperm, Bleached Spring.....	65¢ 67¢
Sperm, Bleached Winter.....	68¢ 70¢
Tallow, Prime.....	62¢ 64¢
Whale, Crude.....	46¢ 47¢
Whale, Natural Winter.....	46¢ 47¢
Whale, Bleached Winter.....	48¢ 49¢
Menhaden, Crude, Sound.....	31¢
Menhaden, Light Strain.....	31¢
Menhaden, Bleached Winter.....	33¢
Menhaden, Ex Bleached Winter.....	33¢
Cocunut, Ceylon.....	7 1/2¢ 8¢
Cocunut, Coshin.....	7 1/2¢ 8¢
Cod, Domestic.....	83¢ 93¢
Cod, Newfoundland.....	85¢ 90¢
Red, Plaine.....	12¢
Red Saponified.....	6 1/2¢ 6 1/4c
Olive, Italian, bbls.....	59¢ 63¢
Neatsfoot, prime.....	53¢ 54¢
Palm, prime, Lagos.....	5 1/2¢ 5 1/4c
Mineral Oils.	
Black, 20 gravity, 25.30 cold	
test.....	9 1/4¢ 10 1/4c
Black, 29 gravity, 15.00 cold test.....	10 1/4¢ 11 1/4c
Black, sum. ner.....	9 1/4¢ 9 1/2c
Cylinder, dark filtered.....	14 1/4¢ 17 1/4c
Paraffine, 903-907 gravity.....	11 1/4¢ 15 1/4c
Paraffine, 903 gravity.....	12 1/4¢ 15 1/4c
Paraffine, 883 gravity.....	9 1/4¢ 11 1/4c
Paraffine, red, No. 1.....	12 1/4¢ 15 1/4c
In small lots 1/2¢ advance.	

THE IRON AGE.

The oldest paper in the world devoted to the interests of the Hardware, Iron, Machinery and Metal Trades, and a standard authority on all matters relating to those branches of industry.

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CURRENT METAL PRICES.

DECEMBER 31, 1901.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL— Bar Iron from Store—

Common Iron: Duty, Round, 0.6¢ per lb.; Square, 0.8¢ per lb.	
1 to 1½ in. round and square	1.90@2.00
1½ to 4 in. x ½ to 1 in.	2.00@2.10
Refined Iron	
1 to 1½ in. round and square	1.05@2.05
1½ to 4 in. x ½ to 1 in.	2.05@2.15
1½ to 4 in. x ½ to 1 in.	2.05@2.15
Rods—¾ and 1-16 round and square	2.95@3.05
Angles:	
3 in x ½ in. and larger	2.50
3 to 3½ in. x ½ in.	2.50
1½ to 3 in. x ½ in.	2.50
1½ to 2½ in. x ½ in. and thicker	2.20@2.30
1 to 1½ in. x 3-16 in.	2.30@2.40
1 to 1½ x ½ in.	2.40@2.50
¾ x ½ in.	2.60
¾ x ½ in.	2.75
¾ x ½ in.	3.50
¾ x 3-16 in.	4.50
Teas:	
1 in.	2.80
1½ in.	2.60
1½ in. and larger	2.50
Beams	2.50@3.00
Channels, 3 in. and larger	2.50@3.00
Bands—1½ to 3-16 to No. 8	2.30
Burden's "Best" Iron, base price	3.15
Burden's "H. B. & S. Iron, base price	2.85
"Uster"	3.60
Norway Bars	3.75@4.30
Norway Shapes	4.00@4.50

Merchant Steel from Store—

Bessemer Machinery	1.90 to 1.95
Toe Calk, Tire and Sleigh Shoe	2.00@2.50
Best Cast Steel, base price in small lots	7½¢
Best Cast Steel Machinery, base price in small lots	6¢

Soft Steel Sheets—

14 inch.	2.20	No. 14	3.00
16 inch.	2.30	No. 16	3.20
No. 6	2.40	No. 18	3.40
No. 10	2.60	No. 20	3.70
No. 12	2.90	No. 22	3.80

Sheet Iron from Store. Black.

	One Pass, C. R.	R. G.
	Soft Steel.	Cleaved.
Nos. 14 to 16	3.80	3.65
Nos. 18 to 21	3.70	3.75
Nos. 22 to 24	3.80	3.85
Nos. 25 and 26	3.80	3.85
No. 27	4.00	4.05
No. 28	4.10	4.15

Russia, Planished, &c.

Genuine Russia, according to assortment	11¢@14¢
Patent Planished	11¢, 12¢, 13¢, net.
Galvanized.	

Nos. 10 to 16	12¢	H. H. 1745 01
Nos. 17 to 21	13¢	
Nos. 22 to 24	14¢	
Nos. 25 to 26	15¢	
No. 27	16¢	
No. 28	17¢	
No. 29	18¢	
No. 30	19¢	
No. 31	20¢	
No. 32	21¢	
80 in. 1¢ & higher.		